U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-257 625

Compilation of Industrial and Municipal Injection Wells in the United States. Volume 2

Environmental Protection Agency

October 1974

PB 257 625

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

BIBLIOGRAPHIC DATA SHEET	1. Report No. EPA/520/9-74/020-Vol-2	2.	3. Recipient's Accession No. PB-257 625

4. Title and Subtitle
Compilation of Industrial and Municipal Injection Wells in the United States. Volume 2

5. Report Date
Oct 74

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Environmental Protection Agency
Washington, D. C.
Oil and Special Materials Control Div.

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. Sponsoring Organization Name and Address

13. Type of Report & Period Covered

14.

15. Supplementary Notes
See also Volume 1, PB-257 624.

16. Abstracts

The data presented is arranged alphabetically by state and numerically within each state to follow the system developed by Warner (1972). The data is presented in a four page format; each page is labelled a-d. In the event that sufficient data is lacking to complete a page of this format that page has been deleted. This data is also available through the STORET/GPSF computer file of EPA. Information on retrieval may be obtained from the STORET User Assistance Group, Division of Monitoring and Data Support, EPA Headquarters.

17. Key Words and Document Analysis. 17a. Descriptors

*Solid waste disposal,
*Industrial wastes,
*Injection wells,
*Tables(data),
*Site surveys,

Inventories,
Water pollution,
Hydrodynamics,
Aquifers,

Fluid flow,
Ground water,
Classification,
Deepwells,
Refuse disposal,
Design,
Equipment,
Construction,
Mineral deposits,
Geology,
Monitoring

17b. Identifiers/Open-Ended Terms

PRICES SUBJECT TO CHANGE

17c. COSATI Field/Group 13 B 8 G 8 F

18. Availability Statement
National Technical Information Service
Springfield, Virginia 22161

19. Security Class (This Report)
UNCLASSIFIED

20. Security Class (This Page)
UNCLASSIFIED

21. No. of Pages
676p

22. Price
16.25/2.25

EPA-520/9-74-020
October 1974

VOLUME 2

Compilation of Industrial and Municipal Injection Wells in the United States

Environmental Protection Agency
Library Systems Branch, Room 2903
401 M Street, S.W.
Washington, D.C. 20460

United States Environmental Protection Agency
Office of Water Program Operations
Oil and Special Materials Control Division
Special Sources Control Branch
Washington, D. C. 20460

1<

Data

The following data is arranged alphabetically by state and numerically within each state to following the system developed by Warner (1972). The data is presented in a four (4) page format; each page is labelled a-d. In the event that sufficient data is lacking to complete a page of this format that page has been deleted.

The codes used with permit status and operating status are those used in Tables 1 and 2 respectively.

This data is also available through the STORET/GPSF computer file of EPA. Information on retrieval may be obtained from the STORET User Assistance Group, Division of Monitoring and Data Support, EPA Headquarters.

Well Id. Code: MI-18

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Michigan Chemical Corporation
St. Louis, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): NW 1/4, NW 1/4, NE 1/4, Sec. 23, T12N, R2W.
4. County: Gratiot State: Michigan
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from the processing of natural brines
2. Date Well Permitted: 5/67 Completed:
3. Injection Rate: 320,000 gpy
4. Injection Pressure: Vacuum
5. Total Depth of Well: 3762 ft.
6. Name, Age, and Depth of Injection Zone: Dundee, Devonian, 3422
7. Date Injection Began: (Day) (Month) 05 (Year) 67
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian			sandstone
Coldwater	Mississippian			shale
Antrim	Devonian			shale
Traverse	Devonian			cherty limestone
Dundee	Devonian			dolomite

(a)3<

WIC MI-18

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Dundee	Coldwater, Antrim
(2)	Depth (Ft.)	3422	
(3)	Thickness (Ft.)	341 open hole	
(4)	Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5)	Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7)	Age of Unit	Devonian	Miss.-Devonian
(8)	Porosity %		
(9)	Permeability, millidarcies		
(10)	Reservoir Temperature, °C		
(11)	Character and Areal Distribution	dolomite/limestone	shale & carbonates, extensive

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Marshall				sandstone	freshwater for municipal use

4. Mineral Resources in Area: Coal bearing Pennsylvanian strata are located in the area of the disposal well. Small oil and gas pools are also found in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste effluent from the processing of natural brines. Calcium chlorides brine.

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: N/A
B. Conc. Dissolved Solids, mg/l: N/A
C. Specific Gravity: 1.2
D. Temperature: N/A
E. pH: N/A

3. Toxicity: Recommended limit of $CaCl_2$ in drinking water 500 mg/l

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Sedimentation and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	H-40 46 #/ft.	13-3/8	704
Intermediate	11	J-55 36 #/ft.	8-5/8	3421
Injection			3/4	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 casing - 525 cu. ft. cement. - 8-5/8 casing - 580 cu. ft. cement.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC MI-18

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	9/2/69	Average	95	Maximum	
"	10/69		187		
"	11/69		223		
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	9/69	Average	Vac	Maximum	144
"	10/69		Vac		150
"	11/69		Vac		155
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and volume monitors.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: MI-19

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Semet-Solvey Division
Allied Chemical Company

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°15'30"/83°07'30"
3. Well Location (Legal Description): N/A
4. County: Wayne State: Michigan
5. SIC Classification: 2815

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from the manufacture of metallurgical coke and by-product chemicals.
2. Date Well Permitted: 6/69 Completed:
3. Injection Rate: 100,000 - 150,000 gal./day
4. Injection Pressure: N/A
5. Total Depth of Well: 4112 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 4040
7. Date Injection Began: (Day) (Month) 06 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene		104	clay/gravel
Dundee	Devonian	104	66	limestone
Detroit R.	Devonian	170	378	limestone
Sylvania	Devonian	548	72	sandstone
Bass Island	Silurian	620	360	dolomite
Salina	Silurian	980	1320	anhydrite, halite
Niagaran Series	Silurian			cherty limestone
Cincinnatian	Ordovician	2300	590	limestone/shale
Trenton	Ordovician	2910	630	limestone
Eau Claire	Cambrian	3815	250	sandstone
Mt. Simon	Cambrian	4040		sandstone

WIC MI-19

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon & Eau Claire	Bass Is.-Trenton
(2) Depth (Ft.)	3815	620
(3) Thickness (Ft.)	348 (open hole)	3764 (casing point)
(4) Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Cambrian	Silurian-Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone widespread	limestone, dolomite

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift		104		clay/sand/gravel	
Sylvania	548	72		sandstone	

4. Mineral Resources in Area: There are a few small oil and gas pools west of the disposal site.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 2000 mg/1 Cl, 9500 mg/1 Ammonia, 100 ppm phenol, viscosity at 20°C 1.12 cp; waste effluent from the manufacture of metallurgical coke and by-product chemicals.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 3450
   B. Conc. Dissolved Solids, mg/l: 3350
   C. Specific Gravity: 1.01
   D. Temperature: N/A
   E. pH: 9.8

WIC MI-19

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	H-40 40 #/ft.	13-3/8	121
Intermediate		J-55 24 #/ft.	8-5/8	1774
		J-55 14 #/ft.	5	3764
Injection		J-55 6.5 #/ft.	2-1/2	4106
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 in. casing - 1315 sks - 8-5/8 in. casing - 5455sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker Model "A" packer at 3720 ft.

5. Bottom Hole Completion: Perforated completion 3754 ft. to 4106.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Mt. Simon acidization 5,000 gal. Mt. Simon-buffer injection (8,400 gal. freshwater).

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC MI-19

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** N/A

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Must operate as permitted.

Well Id. Code: MI-20

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: Glaser Crandell Co.
Mattawan, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: . N/A
3. Well Location (Legal Description): NW 1/4, SE 1/4, NW 1/4, Sec. 13, T3S, R13 W
4. County: Van Buren State: Michigan
5. SIC Classification: 2035

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from the production of pickles and relishes.
2. Date Well Permitted: 6/68 Completed:
3. Injection Rate: 108,000 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 1660 ft.
6. Name, Age, and Depth of Injection Zone: Detroit River, Devonian, 1442.
7. Date Injection Began: (Day) (Month) 05 (Year) 58
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	300	clay/gravel
Coldwater	Mississippian	303	792	shale
Antrim	Devonian	1095	111	shale
Traverse	Devonian	1206	237	cherty limestone
Detroit R.	Devonian	1442		limestone

WIC MI-20

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Detroit R.	Coldwater-Traverse
(2) Depth (Ft.)	1442	
(3) Thickness (Ft.)	Only 3 ft. perforated	
(4) Formation Fluid Pressure, psi	0.43 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Devonian	Miss.-Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	shale & limestone, widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift		300		sand/gravel	

4. Mineral Resources in Area: There are several large oil and gas accumulations in the vicinity of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste from the production of pickles and relishes.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Insufficient data to completely assess waste characteristics.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			10-1/2	362
Intermediate				
Injection			7	1651
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** sur. 225 sks. inj. 426 cu. ft.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforated completion 6 holes from 1627 to 1630 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidization - 1000 gal. Super X. 28% HCl 1651 to 1773 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC MI-20

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) Average Maximum
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) Average Maximum
"
"
"

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: MI-21

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN
Operating Company Name and Address: Dow Chemical Co.
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 43°35'25"/84°05'07"
3. Well Location (Legal Description): SW 1/4, NW 1/4, SW 1/4, Sec 21, T14N, R2E
4. County: Midland State: Midland
5. SIC Classification: 4950

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from oil refinery and salt mining operation.
2. Date Well Permitted: Completed: 5/7/52
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 3740'
6. Name, Age, and Depth of Injection Zone: Dundee, Devonian 3715'
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: This is a stand-by well

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian	1200		sandstone
Dundee	Devonian	3580		limestone

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Dundee	
(2)	Depth (Ft.)	3715	1300
(3)	Thickness (Ft.)	158	
(4)	Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5)	Lithostatic Pressure, psi	1.0 psi/ft est.	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7)	Age of Unit	Devonian	Miss. - Dev.
(8)	Porosity %		
(9)	Permeability, millidarcies		
(10)	Reservoir Temperature, °C		
(11)	Character and Areal Distribution	limestone widespread	shale, limestone, and sandstone widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Saginaw	340	90		sandstone	
Parma	795	80		sandstone	
Marshall	1180	120		sandstone	

4. Mineral Resources in Area: Highly saline brines are pumped from Devonian age rocks and used as a source for chemical products

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste from oil refinery and salt mining operations. Organic waste with phenol, brine, propylene oxide, methyl cellulose and organic wash.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC MI-21

3. **Toxicity:** Phenols fatal to humans at 1.5 grams

4. **Reactivity with Surface Equipment Components:** Corrosive

5. **Degradability Level and Rate:** Phenols degrade in 1-7 days at 20° C, slower under anaerobic conditions

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Minimal

7. **Pre-injection Waste Treatment:** Settling, pH control

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			10-3/4	1265
Intermediate			7	3545
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4" casing - 600 sks; 7"casing - 260 sks

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforated completion

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 10,000 gal 2% HF

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Two holding basins

2. **Filters:** N/A

WIC ______MI-21______

3. Pumps: ____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)__________ Average__________ Maximum__________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)__________ Average__________ Maximum__________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: __________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: __________

2. Contingency Plan for Well Failure During Operation: __________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: MI-22

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Dow Chemical Company
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 43°35'25"/87°05'07"
3. Well Location (Legal Description): SW 1/4, NW 1/4, SW 1/4, Sec. 21, T14N, R2E
4. County: Midland State: Michigan
5. SIC Classification: 4950

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Oil refinery and brine processing.
2. Date Well Permitted: 1967 Completed:
3. Injection Rate: 50 mgd
4. Injection Pressure: 835 psi
5. Total Depth of Well: 4299 ft.
6. Name, Age, and Depth of Injection Zone: Dundee, Devonian - 3865 ft.
7. Date Injection Began: (Day) (Month) (Year) 67
8. Total Volume Injected to Date: 203,130,910 (3/1/73) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian	1200		sandstone
Dundee	Devonian	3580		limestone

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Dundee	
(2) Depth (Ft.)	3865	1300
(3) Thickness (Ft.)	70-108	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	Miss.-Devonian
(8) Porosity %	16-17	
(9) Permeability, millidarcies	100	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	shale, limestone, sandstone, widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Saginaw	240	90		sandstone	
Parma	795	80		sandstone	
Marshall	1180	120		sandstone	

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Oil refinery and brine processing. Organic wastes consisting of phenol, propylene oxide, methyl cellulose, and wash water and spent brines.
2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. **Toxicity:** Chlorides in domestic water supply should be approximately 250 mg/1, total dose of 1.5 grams of phenol may be fatal to humans.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metalic components.

5. **Degradability Level and Rate:** Phenol degrades in 1 to 7 days at 20°C, 5-19 days at 4°C, and at lower rates in anaerobic environment.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			14	264
Intermediate		28 #/ft.	8-5/8	1398
		24 #/ft.	7	3983
Injection			5-1/2	3251
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8 inch casing - 50 sks. - 7" casing - 150 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Annulus filled with water solution of sodium dichromate; Baker Model "F" Retention and Production Packer @ 3250'.

5. **Bottom Hole Completion:** N/A

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2 holding tanks.

2. **Filters:** N/A

WIC MI-22

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	2/69	**Average**	213	**Maximum**	
"	2/70		188		
"	2/71		90		
"	2/72		97		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	2/69	**Average**	620	**Maximum**	
"	2/70		630		
"	2/71		620		
"	2/72		590		

3. **Annual Volume Injected, gal.**
A. 1972 50,606,450 **B.** 1971 50,330,340 **C.** 1970 47,502,815

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** N/A

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** standby well

3. **Regulatory Aspects**

A. **Construction Requirements:** Constructed, equipped and maintained in a manner that will prevent pollution of freshwater or endanger any natural resources.

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Must operate as permitted.

Well Id. Code: MI-23

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Dow Chemical Company
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 43°35'25"/87°05'07"
3. Well Location (Legal Description): SE 1/4, SW 1/4, NE 1/4, Sec. 27, T14S, R3E.
4. County: Midland State: Michigan
5. SIC Classification: 4950

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Oil refining and salt mining - brine disposal.
2. Date Well Permitted: 12/3/51 Completed:
3. Injection Rate: 68 gpm
4. Injection Pressure: 685 psi
5. Total Depth of Well: 5150 ft.
6. Name, Age, and Depth of Injection Zone: Sylvania, Devonian, 4925
7. Date Injection Began: (Day) (Month) 05 (Year) 60
8. Total Volume Injected to Date: 271,311,955 (1/73) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sylvania	
(2) Depth (Ft.)	4925	
(3) Thickness (Ft.)	187	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Oil refining and salt mining.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC MI-23

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Sedimentation and pH control.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		40 #/ft.	10-3/4	1380
Intermediate		20 #/ft.	7	4898
Injection			5-1/2	4926
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** sur. - 650 sks. - intermed. - 600 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Hook Wall Packer at 4822 ft. on 7 inch tubing - annular area filled with sodium bichromate. Packer Model Baker AC @ 4898 on 5-1/2 inch tubing.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidization - 10,000 gal. of 20% HCl 9/7/51.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2 holding tanks.

2. **Filters:** N/A

WIC MI-23

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	10/69	Average	241	Maximum	
"	11/69		276		
"	12/70		157		
"	12/71		132		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	10/69	Average	770	Maximum	
"	11/69		670		
"	12/70		670		
"	12/71		660		

3. Annual Volume Injected, gal.

A. 1972 33,984,520 B. 1971 70,146,805 C. 1970 69,403,110

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: MA-21 is a standby well.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: MI-24

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Dow Chemical Company
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 43°35'25"/87°05'07"
3. Well Location (Legal Description): Sec. 22, T14N, R2E.
4. County: Midland State: Michigan
5. SIC Classification: 4950

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant.
2. Date Well Permitted: 6/64 Completed:
3. Injection Rate: 60 gpm
4. Injection Pressure: 2260 psi
5. Total Depth of Well: 3950
6. Name, Age, and Depth of Injection Zone: Dundee, Devonian, 3915
7. Date Injection Began: (Day) (Month) 06 (Year) 64
8. Total Volume Injected to Date: 36,972,675 (11/1/72) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC MI-24

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Dundee	
(2) Depth (Ft.)	3915	
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone dolomite	

C. Chemical Characteristics of Formation Fluids: Saline.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chemical Plant. Activated sludge from waste treatment-contains 3% organic solids. Also spent brines and plant wastewaters.

2. Physical/Chemical Description
   A. Cons. Suspended Solids, mg/l: N/A
   B. Cons. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Insufficient data to fully assess toxicity - chlorides in domestic water supply should be limited at approximately 250 mg/l.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components by brine.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Settling and screening.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			11-3/8	1388
Intermediate		36 #/ft.	8-5/8	3740
Injection		steel tubing	3-3/8	3915
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 11-3/8 cemented to surface; 8-5/8 lower 1850 cemented.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Annulus water filled.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidization - 10,000 gal. HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Screens

WIC MI-24

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	7/69	**Average**	60	**Maximum**	
"	7/70		60		
"	7/71		60		
"	7/72		106		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	7/69	**Average**	2205	**Maximum**	
"	7/70		1925		
"	7/71		1470		
"	7/72		1015		

3. **Annual Volume Injected, gal.**
A. 1972 8,246,175 B. 1971 86,400 C. 1970 6,230,700

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** N/A

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** MI-21 is standby well.

3. **Regulatory Aspects**

A. **Construction Requirements:** N/A

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Must operate as permitted.

Well Id. Code: MI-25

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Dow Chemical Company
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 43°35'25"/87°05'07"
3. **Well Location (Legal Description):** NW 1/4, NW 1/4, NW 1/4, Sec. 28, T14N, R2E.
4. **County:** Midland **State:** Michigan
5. **SIC Classification:** 4950

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Oil refinery and brine processing wastes.
2. **Date Well Permitted:** 1/49 **Completed:**
3. **Injection Rate:** 97 gpm
4. **Injection Pressure:** 315 psi
5. **Total Depth of Well:** 4269 ft.
6. **Name, Age, and Depth of Injection Zone:** Dundee, Devonian, 3912
7. **Date Injection Began: (Day)** **(Month)** 09 **(Year)** 66
8. **Total Volume Injected to Date:** 80,847,275 (2/1/73) **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian	1200		sandstone
Dundee	Devonian	3500		limestone

WIC MI-25

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Dundee	
(2) Depth (Ft.)	3912	
(3) Thickness (Ft.)	48	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Saginaw	410	85		sandstone	usable fresh water
Parma	817	66		sandstone	usable fresh water
Marshall	1160	44		sandstone	usable fresh water

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Organic wastes including phenol, propylene oxide, methyl cellulose, wash water, spent brine.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC MI-25

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		24 #/ft.	8-5/8	1515
Intermediate		20 #/ft.	7	2290
Injection		15.5 #/ft.	5-1/2	3761
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8-5/8" casing - cemented to surface. 7" casing - 300 sks for 1515 ft. from bottom.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker Model "A" Packer at 3663 ft., annulus filled with water sol. of sodium dichronate.

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC MI-25

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
10/69	175	
" 11/69	201	
" 1/71	128	
" 1/72	0	

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
10/69	560	
" 11/69	630	
" 1/71	550	
" 1/72	0	

3. Annual Volume Injected, gal.
A. 1972 156,365 B. 1971 17,558,490 C. 1970 38,827,065

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: This is a standby well.

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: MI-26

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Dow Chemical Company
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 43°35'25"/87°05'7"
3. Well Location (Legal Description): NW 1/4, SW 1/4, SW 1/4 Sec. 22, T14N, R2E
4. County: Midland State: Michigan
5. SIC Classification: 4950

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Oil refinery and salt processing wastes.
2. Date Well Permitted: 6/69 Completed:
3. Injection Rate: 97 gpm
4. Injection Pressure: 380 psi
5. Total Depth of Well: 5153 ft.
6. Name, Age, and Depth of Injection Zone: Sylvania, Devonian, 4986
7. Date Injection Began: (Day) (Month) 06 (Year) 69
8. Total Volume Injected to Date: 125,639,930 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian	1200		sandstone
Dundee	Devonian	3580		dolomite
Sylvania	Devonian	4986		sandstone

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sylvania	
(2) Depth (Ft.)	4986	
(3) Thickness (Ft.)	131	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	1265	
(7) Age of Unit	Devonian	
(8) Porosity %	16-17	
(9) Permeability, millidarcies	100	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Saginaw	240	90		sandstone	
Parma	795	80		sandstone	
Marshall	1180	120		sandstone	

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Organics including phenol, propylene oxide, methyl cellulose, and wash water, and spent brines.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. Toxicity: Phenol toxic at 1.5 grams.

4. Reactivity with Surface Equipment Components: Possibly corrosive

5. Degradability Level and Rate: Phenol will degrade 4-7 days at 20°C but slower under anaerolic conditions.

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	24	H-40 40.5 #/ft.	10-3/4 in.	1390 ft.
Intermediate	15	J-55 23 #/ft.	7	4970
	9-3/4	line pipe 2	18	86.75
Injection		J-55 12.75 #/ft.	4-1/2	4970
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Surf. 144 sks to surface; 10-3/4 casing - 900 sks neat cement; 7 casing - 376 sks dia cel. D 50/50 mix with 4% gel. + 616 sks with 2% gel. + 355 sks neat; 10-3/4 casing - 75 sks dia. cell D to top.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer at 4960 ft., 4 centralizers on 7 in. string.

5. Bottom Hole Completion: Open hole completion

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC MI-26

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	7/70	Average	177	Maximum	
"	2/71		58		
"	2/72		86		
"	2/73		97		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	7/70	Average	580	Maximum	
"	2/71		750		
"	2/72		420		
"	2/73		380		

3. Annual Volume Injected, gal.
A. 1972 46,365,811 B. 1971 48,400,280 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: MA-21 Standby well.

3. Regulatory Aspects

A. Construction Requirements: Constructed so as to protect ground water and other natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: MI-27

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: Dow Chemical Company
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 74
2. Latitude and Longitude: 43°35'25"
3. Well Location (Legal Description): SE 1/4, SE 1/4, NE 1/4, Sec. 26, T14N, R2E
4. County: Midland State: Michigan
5. SIC Classification: 4950

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from oil refinery and salt processing.
2. Date Well Permitted: 1960 Completed:
3. Injection Rate: 72 gpm
4. Injection Pressure: 545 psi
5. Total Depth of Well: 5182 ft.
6. Name, Age, and Depth of Injection Zone: Sylvania, Devonian, 4922
7. Date Injection Began: (Day) (Month) (Year) 60
8. Total Volume Injected to Date: 73,264,515 (2/73) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian	1220		sandstone
Dundee	Devonian	3830		limestone
Sylvania	Devonian	4922		sandstone

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sylvania	
(2) Depth (Ft.)	4922	
(3) Thickness (Ft.)	248	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	
(8) Porosity %	16-17	
(9) Permeability, millidarcies	100	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Saginaw	240	90		sandstone	
Parma	795	80		sandstone	
Marshall	1180	120		sandstone	

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Organics similar to phenol brines, propylene oxide, methyl cellulose and wash waters containing small amounts of organic.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Phenol toxic at 1.5 grams

4. **Reactivity with Surface Equipment Components:** Possibly corrosive.

5. **Degradability Level and Rate:** Phenol will degrade in 4-7 days at 20°C in aerobic conditions.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		28 #/ft.	8-5/8	1351
Intermediate		14 #/ft.	5-1/2	4810
Injection			4-1/2	4924
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** surf. - 535 sks. - intermed. - 450 sks. 50/50 lite poz. #3

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker model "A" packer at 4729 ft.; annular space filled with water solution of sodium dichromate.

5. **Bottom Hole Completion:** In May 1960, the 5-1/2 in. casing was perforted at 3338 ft. and cemented to the surface with 800 cu. ft. of 50/50 lite poz. #3.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidization - 10,000 gal. of 20% HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WTC MI-27

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	3/69	**Average**	99	**Maximum**	
"	1/70		72		
"	1/71		56		
"	1/72		58		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	3/69	**Average**	690	**Maximum**	
"	1/70		730		
"	1/71		860		
"	1/72		740		

3. **Annual Volume Injected, gal.**
A. 1972 5,902,000 B. 1971 19,470,745 C. 1970 19,609,365

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** N/A

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** MA-21 is a standby well.

3. **Regulatory Aspects**

A. **Construction Requirements:** Constructed is to protect ground water and other natural resources.

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Must operate as permitted.

Well Id. Code: MI-28

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Dow Chemical Company
Midland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 43°35'25"/87°05'07"
3. Well Location (Legal Description): SE 1/4, SW 1/4, SE 1/4 Sec. 22, T14N, R2E
4. County: Midland State: Michigan
5. SIC Classification:

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Brine disposal.
2. Date Well Permitted: Completed: 3/12/50
3. Injection Rate: 60 gpm
4. Injection Pressure: 1775 psi
5. Total Depth of Well: 5150 ft.
6. Name, Age, and Depth of Injection Zone: Dundee, Devonian, 3645 ft.
7. Date Injection Began: (Day) 12 (Month) 03 (Year) 50
8. Total Volume Injected to Date: 67,721,380 (3/1/73) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian	1200		sandstone
Dundee	Devonian	3580		dolomite
Sylvania	Devonian	4986		sandstone

WIC MI-28

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Dundee.	
(2) Depth (Ft.)	3645	
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Saginaw	240	90		sandstone	
Parma	795	80		sandstone	
Marshall	1180	120		sandstone	

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Brine

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/1: N/A
   B. Conc. Dissolved Solids, mg/1: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC MI-28

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components.

5. **Degradability Level and Rate:** N/A.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		47 #/ft.	11-3/4	1388
Intermediate		36 #/ft.	8-5/8	3740
Injection			7	4300
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 11-3/4 700 sks, 8-5/8 475 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: (3-13-50) 3829-3945' 10,000 gal. 20% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC MI-28

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	2/73	**Average**	60	**Maximum**	
"	2/72		60		
"	2/71		60		
"	2/70		60		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	2/73	**Average**	1775	**Maximum**	
"	2/72		1070		
"	2/71		1330		
"	2/70		1530		

3. **Annual Volume Injected, gal.**
A. 1972 18,248,880 B. 1971 12,681,900 C. 1970 24,576,400

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Flow monitor.

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** Completed, equipped and monitored to prevent pollution of fresh water and natural resources.

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Must operate as permitted.

(d)

Well Id. Code: MI-29

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: H. J. Heinz Company
431 W. 16th Street - Holland, Michigan 49423

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): NW 1/4, SW 1/4, SE 1/4, Sec. 30 T5N R15W
4. County: Ottawa State: Michigan
5. SIC Classification: 2035

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Saline food process liquid waste.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 200 gpm
4. Injection Pressure: N/A
5. Total Depth of Well: 5900
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	5900	
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	
(8) Porosity %	12.2	
(9) Permeability, millidarcies	178	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	

C. Chemical Characteristics of Formation Fluids: pH 6.2, Chlorides 155,000 mg/l, Mg 3900 mg/l, Ca 13,000 mg/l, sodium 78,000 mg/l, specific gravity 1.16.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Saltstock-desalting and pickle processing waters, chloride ions 10,000 ppm, light green color, greenish settled solids, odor of anaerobic bacterial action.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 192 (0.3 micron)
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.0104 @ 40°F
   D. Temperature: 57°F
   E. pH: 4.3

3. **Toxicity:** Chloride limit in domestic water supply should be approximately 250 mg/1, minimum detectable H_2S to taste 0.05 mg/1.

4. **Reactivity with Surface Equipment Components:** @ pH 4.6 - 1018 carbon steel 6.4 mil per year @ 156°F 80 w/severe pitting - 304 stainless steel

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity probably minimal in anaerobic environment.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	65# H-40 ST&C	16	100
Intermediate	13	40.5# H-40 ST&C	10-3/4	550
	9-7/8	23# K-55 LT&C	7	5000
Injection	6-1/2	10.6# K-55 LT&C	4-1/2	4600
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16 casing cemented to surface; 10-3/4 casing - cemented to surface; 7 casing - cemented to surface; two stages.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker Lok Set Packer @ 4600'.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 10,000 gal. 14% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

3. **Annual Volume Injected, gal.**
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. **Monitoring Program**

   A. **Monitoring Devices and Data:** Surface injection pressure, annulus pressure, injection rate, injection fluid temp., pH, S.G. continuous monitoring.

   B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

   C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

   A. **Construction Requirements:** N/A

   B. **Monitoring Requirements:** N/A

   C. **Restrictions of Operation Procedures:** Must operate as permitted.

Well Id. Code: MI-30

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: H. J. Heinz Co.
421 W. 16th St., Holland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Ottawa State: Michigan
5. SIC Classification: 2035

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Salt destocking and pickle processing waters.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC MI-30

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Saltstock esalting and pickle processing waters; chloride 10,000 ppm, light green color, greenish settled solids, odor of anaerobic bacterial action.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 192 (0.3 microns)
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.0104 at 40° F
   D. Temperature: 57° F
   E. pH: 4.3

WIC MI-30

3. Toxicity: Chloride limit in domestic water supply should be 250 mg/l; minimum detectable H_2S to taste is 0.05 mg/l

4. Reactivity with Surface Equipment Components: Corrossive to carbon steel

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity probably minimal in anaerobic environment.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC MI-30

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ____ Average ____ Maximum ____
" ____ ____ ____
" ____ ____ ____
" ____ ____ ____

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ____ Average ____ Maximum ____
" ____ ____ ____
" ____ ____ ____
" ____ ____ ____

3. Annual Volume Injected, gal.
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: MI-31

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: H. J. Heinz
Holland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Ottawa State: Michigan
5. SIC Classification: 2035

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Salt destocking and pickle processing waters.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC MI-31

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Saltstock desalting and pickle processing water; chloride 10,000 ppm, light green color, greenish solids, odor of anaerobic bacterial action.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 192 (0.3 micron)
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.0104 at 40° F
   - D. Temperature: 57° F
   - E. pH: 4.3

(b)

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC MI-31

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)__________ Average__________ Maximum__________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)__________ Average__________ Maximum__________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: MI-32

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Hoskins Manufacturing Co.
4445 Lawton Avenue - Detroit, Michigan 48208

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** N/A
3. **Well Location (Legal Description):** SW 1/4, NE 1/4, NE 1/4, Sec. 32, T27N, R8E
4. **County:** Wayne **State:** Michigan
5. **SIC Classification:** 3312

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Spent and neutralized hydrochloric acid.
2. **Date Well Permitted:** **Completed:** 1/22/72
3. **Injection Rate:** N/A
4. **Injection Pressure:** 561 psi
5. **Total Depth of Well:** 2902
6. **Name, Age, and Depth of Injection Zone:** Dundee, Devonian, 2636
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** 115,360 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	460	sand, gravel
Coldwater	Mississippian	460	918	shale
Sunbury	Mississippian	1378	22	shale
Berea	Mississippian	1400	47	shale
Antrim	Mississippian	1447	443	shale
Traverse	Devonian	1890	674	limestone, dolomite
Bell	Devonian	2564	72	shale
Dundee	Devonian	2636		limestone, dolomite

WIC MI-32

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Dundee	Bell
(2) Depth (Ft.)	2730	2564
(3) Thickness (Ft.)	172	72
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	Devonian
(8) Porosity %	8	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, dolomite	shale

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Spent and neutralized hydrochloric acid used for pickling and annealing wire.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Treatment with soda ash.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32.75 # J-55	10-3/4	640
Intermediate		14# K-55	5-1/2	2700
		Plastic coated (TK 75)	2-3/8	2594
Injection		Seal Lock		
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 casing - 2205 x 50% Pozmix , 6% gel, 2% $CaCl_2$ + 1005 x 3% $CaCl_2$, grouted with 3005 x 3% $CaCl_2$, 5-1/2 casing - 5005 x Halliburton Lite + 1005 x Regular Pozmix 18% salt saturated.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 5-1/2 casing - Halliburton Packer Shoe @ 2699', 15 centralizers - 10-3/4 casing - 3 centralizers, set on Texas pattern Guide Shoe - 2-3/8 tubing - Baker plastic coated tension packer @ 2590 ft.

5. **Bottom Hole Completion:** N/A

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acid treatment: (2/12/72) 2800 2902 ft. 1000 gal.; (2/16/72) 2700 - 2902 ft. 1500 gal.; 20% HCL.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC MI-32

3. **Pumps:** Triplex pump - 1200 psi max.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	1/73	**Average**	6.5	**Maximum**	
"	2/73		10		
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	1/73	**Average**	390	**Maximum**	
"	2/73		561		
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** pH, flow, volume and temp. monitors.

B. **Sampling Frequency and Water Quality Parameters Measured:** Daily

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** N/A

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Must operate as permitted.

Well Id. Code: MI-33

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: E. I. DuPont de Nemours, Inc.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: N/A State: Michigan
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: 11,627,356 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC MI-33

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

WIC MI-33

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC MI-33

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: ____________________

   B. Sampling Frequency and Water Quality Parameters Measured: ____________________

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

   A. Construction Requirements: ____________________

   B. Monitoring Requirements: ____________________

   C. Restrictions of Operation Procedures: ____________________

Well Id. Code: MI-34

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: SNA Operational Status: PND
Operating Company Name and Address: Michigan Chemical Co.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 07 (Month) 09 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Gratiot State: Michigan
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Brine reinjection
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC MI-34

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geochydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC ______ MI-34 ______

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: MS-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Thiokel Chemical Company
Moss Point, Mississippi 39563

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) 04 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: N/A State: Mississippi
5. SIC Classification: 2820

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Synthetic rubber manufacture.
2. Date Well Permitted: 6/22/71 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) 01 (Month) 01 (Year) 52
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

WIC MS-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Solids, ammonia, color, turbidity, hardness, organic nitrogen, sulfate, sulfide, sulfite, chloride, fluoride, iron, magnesium, potassium, sodium, oil and greas, surfactants.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC MS-1

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC ________ MS-1 ________

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: NC-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP

Operating Company Name and Address: Hercules Inc.
Wilmington, North Carolina

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 06 (Year) 73
2. Latitude and Longitude: 34°10'04"/77°58'54"
3. Well Location (Legal Description): N/A
4. County: New Hanover State: North Carolina
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: By-product of dimethylterephthalate (DMT) manufacture.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 109,500,000 gpy
4. Injection Pressure: 150 psi
5. Total Depth of Well: 1025 ft.
6. Name, Age, and Depth of Injection Zone: Black Creek, Cretaceous
700 - 1100 ft.
7. Date Injection Began: (Day) (Month) 05 (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) 10 (Year) 69
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC NC-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Black Creek	Black Creek-Peedee
(2) Depth (Ft.)	850	100
(3) Thickness (Ft.)	250	800
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	clay, sand, limestone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid = 15,000 ppm; formic acid = 5,000 ppm; methanol = 500 ppm.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 4

WIC NC-1

3. **Toxicity:** Methanol highly toxic to humans; organic acids may be caustic.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metal fixtures with constatn contact with organic acids.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; breakdown of organics possible with oxygen provided from acids.

7. **Pre-injection Waste Treatment:** Waste filtered to remove particles over 20 microns.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC NC-1

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Injection rate monitored by metered rate of flow indicator, totalizing unit and automatic chart recorder.

B. Sampling Frequency and Water Quality Parameters Measured: Samples collected weekly from each well and reported monthly.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Wastes pumped to monitoring well

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Injection pressure not to exceed 150 psi.

Well Id. Code: NC-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** DN

Operating Company Name and Address: Hercules, Inc.
Wilmington, North Carloina

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 34°19'04"/77°58'54"
3. Well Location (Legal Description): N/A
4. County: New Hanover State: North Carolina
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: By-product of dimethylterephthalate (DMT) manufacture.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 300,000 gpd
4. Injection Pressure: 150 psi
5. Total Depth of Well: 1025 ft.
6. Name, Age, and Depth of Injection Zone: Black Creek, Cretaceous 700 - 1100 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
    A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC NC-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Black Creek	Black Creek
(2) Depth (Ft.)	850	100
(3) Thickness (Ft.)	250	700
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	clay, sand limestone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid 15,000 ppm; formic acid 5,000 ppm; methanol 500 ppm.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

WIC NC-2

3. Toxicity: Methanol highly toxic to humans, and organic acids may be caustic.

4. Reactivity with Surface Equipment Components: Possibly corrossive with constant contact with organic acids.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; possible degradation of organics with oxygen provided by alcohols and acids.

7. Pre-injection Waste Treatment: Waster filtered to remove particles greater than 20 microns.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

(c)

WIC NC-2

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Injection rate monitored by metered rate of flow indicator, totalizing unit and automatic chart recorder.

B. Sampling Frequency and Water Quality Parameters Measured: Samples collected weekly from each well and reported monthly.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Wastes pumped to monitoring wells in immediate vicinity.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: NC-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN
Operating Company Name and Address: Hercules, Inc.
Wilmington, North Carolina

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 34°19'04"/77°58'54"
3. Well Location (Legal Description): N/A
4. County: New Hanover State: North Carolina
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: By-products of dimethylterephthalate (DMT) manufacture.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 300,000 gpd
4. Injection Pressure: 150 psi
5. Total Depth of Well: 1025 ft.
6. Name, Age, and Depth of Injection Zone: Black Creek, Cretaceous 700 - 1100 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Waste pumped into well NC-1

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC NC-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Black Creek	Black Creek
(2) Depth (Ft.)	850	100
(3) Thickness (Ft.)	250	700
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	clay, sand, limestone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid 15,000 ppm; formic acid 5,000 ppm; methanol 500 ppm.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC NC-3

3. **Toxicity:** Methanol highly toxic to humans and organic acids may be caustic.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metal fixtures with constant contact with organic acids.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, breakdown of organics possible with oxygen provided from alcohols and acids.

7. **Pre-injection Waste Treatment:** Waste filtered to remove particles greater than 20 microns, liming and deaeration discontinued.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC NC-3

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Injection rate monitored by metered rate of flow indicator, totalizing unit and automatic chart recorder.

B. Sampling Frequency and Water Quality Parameters Measured: Samples collected weekly from each well, reported monthly.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Wastes pumped to monitoring wells in immediate vicinity.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: NC-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN

Operating Company Name and Address: Herculea, Inc.
Wilmington, North Carolina

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 34°18'48"/77°58'38"
3. Well Location (Legal Description): N/A
4. County: New Hanover State: North Carolina
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: By-product of dimethylterephthalate (DMT) manufacture.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Deep well complex.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC NC-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid 15,000 ppm; formic acid 5,000 ppm; methanol 500 ppm.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

(b)

WIC NC-4

3. **Toxicity:** Methanol highly toxic to humans, and organic acids may be caustic.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metal fixtures in constant contact with acids.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial degradation of organics facilitated by oxygen from alcohols and acids.

7. **Pre-injection Waste Treatment:** Filtered to remove particles over 20 microns.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC ____________ NC-4

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: NM-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR
Operational Status: 0
Operating Company Name and Address: The Anaconda Company
P.O. Box 638 - Grants, New Mexico

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 02 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Grant State: New Mexico
5. SIC Classification: 1094

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Uranium processing wastes
2. Date Well Permitted: 1960 Completed:
3. Injection Rate: 54,919,400 gpy
4. Injection Pressure: N/A
5. Total Depth of Well: 2511 ft. plugged back to 1830 ft.
6. Name, Age, and Depth of Injection Zone: Yeso, Permian 1830 ft.
7. Date Injection Began: (Day) 14 (Month) 12 (Year) 60
8. Total Volume Injected to Date: 625,116,740 (1/1/62-1/1/73) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Chinle	Triassic	0	350	limestone, shale
San Andreas	Permian	350	200	sandstone, limestone
Yeso	Permian	550	1000	sandstone, shale
Abo	Permian	1550	700	sandstone, shale

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Yeso	Yeso
(2) Depth (Ft.)	950	550
(3) Thickness (Ft.)	563	400
(4) Formation Fluid Pressure, psi	0.44 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	Permian
(8) Porosity %	16.5	
(9) Permeability, millidarcies	105	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	shale, sandstone

C. Chemical Characteristics of Formation Fluids: TDS = 4060 ppm; Na = 414 ppm; Mg = 157 ppm; Ca = 592 ppm; Cl = 304 ppm; Fe = 17.5 ppm pH = 7.3

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
San Andreas	360	300		limestone	potable

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Six wells in the area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Mildly acidic solution containing high concentrations of Mg, Fe, SO_4, and Cl, also low concentrations of uranium, Th-230, and Ra-226.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Uranium and thorium very toxic to humans.

4. **Reactivity with Surface Equipment Components:** Possible due to acids.

5. **Degradability Level and Rate:** Natural radioactive decay.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Liquid decanting of solids; treated with copper sulfate and polyphosphate; and filtered to 0.1 ppm turbidity.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17		13-3/8	730
Intermediate	11		8-5/8	1830
		316 Stainless Steel	6-5/8	
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** N/A

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforated completion

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** All surface equipment is lined with rubber or constructed of 316 steel. 300 gallon surge tank and 1.4 miles of 12" rubber lined pipe.
2. **Filters:** Screen filter and 2 leaf filters

WIC NM-1

3. Pumps: Two 316 steel sump pumps.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 1972 67,273,815 B. 1971 75,922,590 C. 1970 60,524,440

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow volume and pressure.

B. Sampling Frequency and Water Quality Parameters Measured: Weekly

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Weekly measurement of wells in the vicinity of the mill and disposal well.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Three springs, three ponds and several municipal wells are analyzed monthly.

C. Restrictions of Operation Procedures: Records of a) volume of waste, b) average concentration of radioactive material, c) natural hydraulic pressure, and d) injection rate, to maintain USAEC license.

Well Id. Code: NV-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Cliffs Copper Corporation
Mountain City, Nevada

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 73
2. Latitude and Longitude: 41°48'51"/115°48'44"
3. Well Location (Legal Description): Sec 11, T45N, R53E
4. County: Elko State: Nevada
5. SIC Classification: 1021

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Ferrous sulfate solution from mining of copper.
2. Date Well Permitted: 4/19/72 Completed:
3. Injection Rate: 260,000,000 gpy
4. Injection Pressure: 875 psig
5. Total Depth of Well: 6697 ft.
6. Name, Age, and Depth of Injection Zone: Valmy, Ordovician
3400
7. Date Injection Began: (Day) 19 (Month) 04 (Year) 72
8. Total Volume Injected to Date: 134,200,000 (1/9/73) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC NV-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Valmy	Valmy
(2) Depth (Ft.)	3400	65
(3) Thickness (Ft.)	3297	3335
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician	Ordovician
(8) Porosity %	20	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	quartzite	slate

C. Chemical Characteristics of Formation Fluids: None

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Copper mined in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Iron sulfate solution remaining after leaching of copper with sulfuric acid and precipitating copper metal from solution on scrap iron.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 1.0
   B. Conc. Dissolved Solids, mg/l: 4500
   C. Specific Gravity: 1.0
   D. Temperature: 55° - 60° F
   E. pH: 2.6 - 2.8

3. **Toxicity:** Possible damage to tissue by ingestion or prolonged contact with undiluted solution.

4. **Reactivity with Surface Equipment Components:** Probable corrosive effect of gighly acid solution on metal components.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Removal of iron hydroxides and other solids with diatomaceous earth precoat primary filter and cartridge-type filter.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	26	94# H-40, T&C seamless	20	60
Intermediate	17-1/2	48# H-40, T&C seamless	13-3/8	600
	9	20# J-55, T&C seamless	7	3400
Injection		15# K-55, T&C, PVC lined	5	3400
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 20" casing - 150 sks regular cement; 13-3/8" casing - 610 sks 50-50 Pozmix; 5" casing - 1350 sks 50-50 Pozmix w/2% CaCl

3. **Well Head Equipment (Name and Models):** ARMCO-National Supply #517140-2A 12" Series 900 casing flange tapped 13-3/8", #518521-A 12" series 900 x 10" casing spool, #520521-070A 7" CMBF casing hanger, #518453-050A 5" slips F/10"

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker Oil tool Model AC stainless steel tension packer set inside 7" stainless steel protection casing at 3400 ft. (20 ft. of 5-1/2" OD 304 stainless steel tailpipe on packer from 3400' to 3420') Packer set at 50,000# pull.

5. **Bottom Hole Completion:** Open hole 3400' to 6697'

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 15,000 gal of 15% HCl solution injected May 4, 1972.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Goulds 3x4 pumps feeds Keene V-500-3 precoat filter and cartridge poligh filter (all 304 stainless steel).

WIC NV-1

3. **Pumps:** 316 stainless steel Bingham 3x4x9C-MSD, 6-stage, horizontal, double volute, centrifugal pump rated at 450 gpm/911' TDH/3,450 rpm.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Fischer-Porter 6" magnetic flowmeter and redorder and Taylor injection recorder.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: NY-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: International Salt Company, Watkin's Glen Refinery

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 73
2. Latitude and Longitude: 42°24'20"/76°53'16"
3. Well Location (Legal Description): N/A
4. County: Schuyler State: New York
5. SIC Classification: 1499

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Refining of salt from brine using evaporation process.
2. Date Well Permitted: 11/3/71 Completed:
3. Injection Rate: N/A
4. Injection Pressure: 80 psi
5. Total Depth of Well: 1710 ft.
6. Name, Age, and Depth of Injection Zone: Marcellus, Devonian 1260 ft.
7. Date Injection Began: (Day) 03 (Month) 12 (Year) 71
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Genesse	Devonian	33	205	shale
Tully	Devonian	239	27	limestone
Hamilton	Devonian	266	874	shale, siltstone
Marcellus	Devonian	1140	300	shale, limestone
Onondaga	Devonian	1440	40	limestone

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Marcellus	Hamilton
(2) Depth (Ft.)	1260	1140
(3) Thickness (Ft.)	55	300
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	shale, limestone	shale, siltstone

C. Chemical Characteristics of Formation Fluids: Sulfurous water

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Tully	239	27		limestone	not potable
Marcellus	1140	300		shale, limestone	brine
Onondaga	1440	40		limestone	not potable

4. Mineral Resources in Area: Texas Eactern LPG storage area approximately 3600 ft. north of disposal area; Watkin's Salt Co. brine fields 2 miles south; Wayne-Dundee gas storage field 6 miles NNW of the disposal area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Brine water that consists of NaCl, $CaCO_3$, Cl_2, $CaSO_4$, and Na_2SO_4.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC NY-1

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosive to metallic components.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Possibly sterile on injection due to presence of chlorine; bacterial activity agter injection minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Wrought iron	10-3/4	70
Intermediate				
Injection		Wrought iron	5-1/2	1085
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 3- Halliburton 5-1/2", 5-3 centralizers; 1 - Hookwall packer at base of 5-1/2" casing.

5. Bottom Hole Completion: Open hole.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Collection system piping; a collection tank, diameter 5' by 5-1/3' deep; a collection tank mixer with 1/3 HP motor.

2. Filters: N/A

WIC NY-1

3. **Pumps:** 2 pumps at 160 gpm at 90' head, 40 psi max; 2 submersible pumps each 160 gpm at 200' head, 125 psi max.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	1/72	Average	40-45	Maximum	
"	2/72		45-50		
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12/71	Average	55-60	Maximum	100
"	1/72		80		
"	2/72		55		
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow meter and pressure recorder.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Casing must be sealed from surface to disposal zone

B. Monitoring Requirements: 5 observation wells required into the lowest fresh water zone (tested every 2 weeks). Pressure outside casing monitored to detect leaks in the casing.

C. Restrictions of Operation Procedures: If salinity in observation wells increases, injection well must be shut down until cause is determined.

Well Id. Code: NY-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN
Operating Company Name and Address: Hooker Chemical Corp., Niagara Falls Plant
Niagara Falls, New York

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 73
2. Latitude and Longitude: 43°05'/79°00'
3. Well Location (Legal Description): N/A
4. County: Niagara State: New York
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: HCl waste
2. Date Well Permitted: Completed: 8/5/68
3. Injection Rate: 0.252 - 0.360 million gpd
4. Injection Pressure: 1350 - 1500 psi
5. Total Depth of Well: 3058 ft.
6. Name, Age, and Depth of Injection Zone: Theresa - Potsdam, Cambrian 2835 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Queenston	Ordovician	1101	237	shale
Lorraine	Ordovician	1338	551	shale
Utica	Ordovician	1889	218	shale
Trenton	Ordovician	2107	518	limestone
Black River	Ordovician	2625	210	limestone
Theresa	Cambrian	2835	100	dolomite, sandstone
Potsdam	Cambrian	2935	91	sandstone
Basement Complex		3026		feldspar schist

(a)

WIC NY-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name	Theresa	Potsdam	Queenston-Utica
(2) Depth (Ft.)	2835	2935	1101
(3) Thickness (Ft.)	100	91	788
(4) Formation Fluid Pressure, psi	1410	1445	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.		
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.		
(7) Age of Unit	Cambrian		Ordovician
(8) Porosity %	4.3		
(9) Permeability, millidarcies	0.1	7.7	
(10) Reservoir Temperature, °C	30°		
(11) Character and Areal Distribution	Dolomite	sandstone	shale
	sandstone		
	extensive		

C. Chemical Characteristics of Formation Fluids: TDS - 270,450 ppm; Sp. Gr. - 1.2; pH - 3.1

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: North Buffalo Medina gas pool 10 miles southeast; gypsum mined 10 miles from site.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHAPACTERISTICS

1. Technical Description (Including Radioactivity): Unreacted HCl, 99.9%; phenol 1440#/day; chloride 1210#/day; dissolved organics 2900#/day

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.06
   D. Temperature: 35° to 45° C
   E. pH: less than 1.0

(b)

WIC NY-2

3. Toxicity: HCl lethal below pH of 5.0; phenol fatal at total dose of 1.5 grams

4. Reactivity with Surface Equipment Components: Corrossive

5. Degradability Level and Rate: Acid degradation of organics.

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection, bacterial activity minimal.

7. Pre-injection Waste Treatment: All water filtered through a five-unit anthracite filter and treated with a biocide concentration of 10 to 15 ppm

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	24"		20"	33
Intermediate	17-1/2	48# H-40	13-3/8	423
	12-1/4	36# J-55	9-5/8	2829
Injection		K-55	7	2815
Other			4-1/2	2815

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 20" casing 1-1/2 cu. yd. Ready mix; 13-3/8" casing - 315 sks Portland w/2% $CaCl_2$; 9-5/8" casing - 465 sks Portland, 825 sks salt, 16 sks gel, Posmix A/25, Flocele 32#; 7" casing - Posmix w/18% salt + 3/4% CFR-2 additive

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker accessories guide shoe, centralizers, metal pedal baskets, bottom wiper plug, top displacement plug, 8 centralizers

5. Bottom Hole Completion: Open Hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized 2835' - 3026' with 12,000 gallons 15% and 25% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC NY-2

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
9/9/68	50	50
" 9/19/68	95	255
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
9/9/68	629	629
" 9/19/68	1510	1510
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: NY-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: DNP Operational Status: DN
Operating Company Name and Address: Bethlehem Steel Corp., Lackawanna Plant
Hamburg Township, New York

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 07 (Year) 73
2. Latitude and Longitude: 42°48'11"/78°50'40"
3. Well Location (Legal Description): N/A
4. County: Erie State: New York
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Steel pickling liquors
2. Date Well Permitted: Completed: 5/18/68
3. Injection Rate: 72,000 gpd
4. Injection Pressure: 900 psi
5. Total Depth of Well: 4313 ft.
6. Name, Age, and Depth of Injection Zone: Theresa - Potsdam, Cambrian
3794 - 4251 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Lorraine-Utica	Ordovician	2247	747	shale
Trenton	Ordovician	2994	596	limestone
Black River	Ordovician	3590	204	limestone
Theresa	Cambrian	3794	337	dolomite, sandstone
Potsdam	Cambrian	4131	120	sandstone
Basement Complex		4251		metamorphic

WIC NY-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name	Theresa	Potsdam	Lorraine - Utica
(2) Depth (Ft.)	3794	4131	2247
(3) Thickness (Ft.)	337	120	747
(4) Formation Fluid Pressure, psi	1938 @ 4000'		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.		
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.		
(7) Age of Unit	Cambrian		Ordovician
(8) Porosity %	5		
(9) Permeability, millidarcies	113		
(10) Reservoir Temperature, °C	25°		
(11) Character and Areal Distribution	dolomite,sandstone extensive		shale extensive

C. Chemical Characteristics of Formation Fluids: Chloride - 203,838 ppm; pH - 7.0; Specific Gravity - 1.22 @77°F

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Medina (Silurian) gas field 5 to 10 miles away, Glade oil field 50 miles; gypsum mined 25 miles away.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 0.5% to 5% HCl, 0 to 25% $FeCl_2$

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.1 - 1.2
   D. Temperature: N/A
   E. pH: 1.0

3. **Toxicity:** HCl lethal at pH lower than 5.0; $FeCl_2$ toxic to fish and aquatic invertebrates at concentrations ranging from less than 1 mg/1 to 5000 mg/1.

4. **Reactivity with Surface Equipment Components:** Corrossive

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtering

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	40# H-40	13-3/8	91
Intermediate	12-1/2	32# H-40	9-5/8	1201
	8-3/4	23# J-55	7	3783
Injection		Fibercast	2-7/8	3800
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8" casing - Besse Portland 100 sks w/2% $CaCl_2$; 9-5/8" casing - 420 sks 50-50 Pozmix w/2% Bentonite & 18% salt; 7" casing - 550 sks 50-50 Pozmix w/2% Bentonite & 18% salt.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 13-3/8" casing guide shoe w/one centralizer; 9-5/8" casing guide shoe, cementing float collars, canvas metal petal basket; bottom wiper plug + top displacement plug

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidizing - 15% HCl, 2000 gal., 3800 - 4300 ft., May, 1968

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 15 to 30 day back-up capacity steel holding tank

2. **Filters:** Filter down to 1 micron size - diatomaceous earth

3. Pumps: Centrifugal pumps with titanium lining.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	5/16/68	Average	25	Maximum	25
"	5/26/68		65		65
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	5/16/68	Average	360	Maximum	380
"	5/26/68		700		700
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: NY-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: DNP **Operational Status:** DN

Operating Company Name and Address: F.M.C. Corp., Niagara Chemical Division
Middleport, New York

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 07 (Year) 73
2. Latitude and Longitude: 43°15'/78°25'
3. Well Location (Legal Description): N/A
4. County: Niagara State: New York
5. SIC Classification: 2879

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of insecticides, pesticides, fungicides, and other chemicals.
2. Date Well Permitted: Completed: 7/30/68
3. Injection Rate: 0.058 - 0.086 million gpd
4. Injection Pressure: 336 - 2300 psi
5. Total Depth of Well: 3189 ft.
6. Name, Age, and Depth of Injection Zone: Theresa, Cambrian, 2660'
Metamorphic Biotite, Pre-Cambrian, 2765
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Queenston	Ordovician	135	837	silty shale
Oswego	Ordovician	1072	80	sandstone
Lorraine	Ordovician	1152	693	shale
Trenton-Black River	Ordovician	1845	815	limestone
Theresa	Cambrian	2660	105	dolomite, sandstone
Metamorphic	Pre-Cambrian	2765		biotite quartzite

WIC NY-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Theresa/Metamorphic	Queenston-Lorraine
(2) Depth (Ft.)	2660 2765	135
(3) Thickness (Ft.)	105 429	1710
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Camb. pCamb.	Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite quartzite sandstone widespread	shale widespread

C. Chemical Characteristics of Formation Fluids: TDS - 213,000 ppm chloride - 118,000 ppm; pH - 10.5

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	100		variable	sand, gravel	fresh

4. Mineral Resources in Area: Mining of gypsum 15 miles southwest; gasfield 10 miles away

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium sulfate and sulfide; sodium chloride; sodium trithio-carbonate

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.022 @ 25°C
   D. Temperature: N/A
   E. pH: 6.32

WIC NY-4

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal

7. **Pre-injection Waste Treatment:** Filtration and settling

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48# H-40	13-3/8	229
Intermediate	10-5/8	24# J-55	8-5/8	1195
	7-7/8	15.5# J-55	5-1/2	2655
Injection		6.5# IK-90 EVE	2-7/8	2465
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8" casing - 175 sks class A Portland w/3% Cal.ch. 15.5#/gal; 8-5/8" casing - 300 sks class A Portland w/2% Cal.ch 15.5#/gal.; 5-1/2" casing - 600 cu. ft. class A Collon 15.5#/ gal. slurry wt.

3. **Well Head Equipment (Name and Models):** O.C.T. head installed and set at 2.25 ft. below ground level

4. **Packers, Centralizers, and Other Subsurface Equipment:** 13-3/8" casing - Baker float shoe and 3 centralizers @45',130', and 196'; 8-5/8" casing - Baker guide shoe and Baker float collar with 5 centralizers; 5-1/2" casing Baker Model D packer @2465' and 6 Baker centralizers

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidizing - 3000 gal. 28% HCl at 2660 - 2765 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Surge tank of 16,000 gallons capacity; emergency reserve pit.

2. **Filters:** Two books of disposal cartridges. Cartridge life will be 1-1/2 to 2 weeks.

WIC NY-4

3. Pumps: Two centrifugal transfer pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Emergency reserve pit.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: OH-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP
Operating Company Name and Address: Empire Reeves Steel, Div. of Cyclops Corp.
Mansfield, Ohio

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 04 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Madison TWP, 766 ft. FSL and 1024 ft. FWL of Sec 16.
4. County: Richland State: Ohio
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Spent pickling liquors from steel processing.
2. Date Well Permitted: 8/18/67 Completed:
3. Injection Rate: 35 gpm
4. Injection Pressure: 1000 psi
5. Total Depth of Well: 5085 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 4982 ft.
7. Date Injection Began: (Day) 22 (Month) 11 (Year) 68
8. Total Volume Injected to Date: 10,314,933 (Gallons)
9. Date Injection Ceased: (Day) 02 (Month) 02 (Year) 71
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OH-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	Eau Claire
(2) Depth (Ft.)	4982	4634
(3) Thickness (Ft.)	82	330
(4) Formation Fluid Pressure, psi	2036	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	Cambrian
(8) Porosity %	10.4	
(9) Permeability, millidarcies	9	
(10) Reservoir Temperature, °C	40°	
(11) Character and Areal Distribution	sandstone	dolomite

C. Chemical Characteristics of Formation Fluids: TDS = 292,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acid, iron, copper and insoluble residue

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 4705
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.19
   D. Temperature: 120° F
   E. pH: 1.0

WIC OH-1

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive due to acid

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-1/2	32.75# J-55	10-3/4	674
Intermediate	9	23# J-55	7	4974
Injection		EUE 9.3# J-55	3-1/2	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 375 sks 50-50 Pozmix w/2% salt gel; 7 inch casing - 1165 sks 4. density w/1% CFR-2.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 18 centralizers; cement baskets at 1772 and 4904 ft.; D-V collar at 1905 ft.; Halliburton shoe at 4975 ft.; Carpenter No. 20Cb3 joint at 4961 to 4972 ft.

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Buffer zone - 2 million gallons of fresh water.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

(c)

WIC OH-1

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	4/69	Average	16	Maximum	
"	1/70		17		
"	5/70		15		
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	4/69	Average	1250	Maximum	1750
"	1/70		360		595
"	5/70		300		615
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Monthly reports; periodic pressure checks, continuous rates and pressure recorders.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. **Monitoring Requirements:** Injection rate and flow, annulus pressure, waste characteristics.

C. **Restrictions of Operation Procedures:** Must operate as permitted.

Well Id. Code: OH-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Armco Steel Corporation
Middletown, Ohio

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 28 (Month) 03 (Year) 73
2. Latitude and Longitude: 39°21'/84°22'
3. Well Location (Legal Description): Lemon TWP, 1055 ft. FNL and 65 ft. FWL of sec 8.
4. County: Butler State: Ohio
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Hydrochloric acid pickle liquor and pickle rinse water.
2. Date Well Permitted: 10/20/67 Completed: 3/12/67
3. Injection Rate: 100 gpm
4. Injection Pressure: 60 psi
5. Total Depth of Well: 3296 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 2954 ft.
7. Date Injection Began: (Day) (Month) 06 (Year) 69
8. Total Volume Injected to Date: 24,456,652 (6/5/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Richmond Group	Ordovician	90	446	limestone, shale
Cynthiana	Ordovician	536	102	limestone
Trenton	Ordovician	638	28	limestone
Black River	Ordovician	666	294	limestone
Chazy	Ordovician	960	192	limestone
St. Peter	Ordovician	1152	20	sandstone
Chepultepec	Cambrian	1172	460	dolomite
Copper Ridge	Cambrian	1632	732	dolomite
Conasauga	Cambrian	2364	144	shale
Rome	Cambrian	2508	338	
Shady	Cambrian	2846	108	dolomite
Mt. Simon	Cambrian	2954		sandstone

WIC OH-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2954	300
(3) Thickness (Ft.)	282	2600
(4) Formation Fluid Pressure, psi	1200	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	Ordovician-Cambrian
(8) Porosity %	7 - 14	
(9) Permeability, millidarcies	66 - 524	
(10) Reservoir Temperature, °C	30°	
(11) Character and Areal Distribution	sandstone widespread	limestone, shale widespread

C. Chemical Characteristics of Formation Fluids: TDS = 189,000 ppm; Cl^- = 110,000 ppm; Na = 40,000 ppm; Ca = 20,400 ppm.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Maximum - 1% HCl, 25% $FeCl_2$, and 1.5% $FeCl_3$.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 9 - 15 (less than 0.5 micron)
   B. Conc. Dissolved Solids, mg/l: 250,000
   C. Specific Gravity: 1.16 - 1.18
   D. Temperature: 100° - 150° F
   E. pH: less than 1.0

119a (b)

WIC OH-2

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive, surface equipment designed to resist attack.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Filtration by pressure leaf-type filter capable of removing suspended solids larger than 2 microns.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48# H-40	13-3/8	310
Intermediate	12-1/2	36# J-55	9-5/8	2922
Injection		Epoxy chemical tubing	3-1/2	2906
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 250 sks; 9-5/8 inch casing - 900 sks; 3-1/2 inch casing - 50 sks.

3. Well Head Equipment (Name and Models): National tubing hanger type "E".

4. Packers, Centralizers, and Other Subsurface Equipment: Annulus filled with refined mineral oil under 600 psi. Seal Baker model 190-47 Model G and 3-1/2" slim hole centralizers.3-1/2" x 8-5/8" packer model "D".

5. Bottom Hole Completion: Open hole.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Buffer zone - 4,900,000 gallons of fresh water.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two 75,000 gal. capacity holding tanks.

2. Filters: Two vertical pressure leaf with diatomaceous earth precoat, rate as 0.5 gpm/ft^2.

3. Pumps: 2 - centrifugal transfer pumps rated 100 gpm; 1 - triplex plunger injection pump rated 100 gpm at 1500 ft.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
6/69	28	
6/70	51	
6/71	45	
6/72	89	

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
6/69	165	
6/70	10	
6/71	80	
6/72	430	

3. Annual Volume Injected, gal.

A. 1972 9,197,927 B. 1971 13,098,913 C. 1970 1,629,632

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous rate/pressure recorder, annulus pressure checked periodically, turbrimeter.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Flow rate and injection volume.

C. Restrictions of Operation Procedures: Operate as permitted.

Well Id. Code: OH-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Armco Steel
Middletown, Ohio

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 28 **(Month)** 03 **(Year)** 73
2. **Latitude and Longitude:** 39°29'/84°22'
3. **Well Location (Legal Description):** Lemon TWP, 1190 ft. FNL and 1365 ft. FWL of Sec 8.
4. **County:** Butler **State:** Ohio
5. **SIC Classification:** 3312

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Hydrochloric acid pickle liquor and pickle rinse water.
2. **Date Well Permitted:** 10/24/67 **Completed:** 4/24/68
3. **Injection Rate:** 100 gpm
4. **Injection Pressure:** 10 - 500 psi
5. **Total Depth of Well:** 3285 ft.
6. **Name, Age, and Depth of Injection Zone:** Mt. Simon, Cambrian 2940 ft.
7. **Date Injection Began: (Day)** **(Month)** 05 **(Year)** 69
8. **Total Volume Injected to Date:** 34,154,310 (6/17/72) **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** None

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
    A. **Geological Description of Rock Units Penetrated by Well**

(a) **Name**	(b) **Age**	(c) **Depth**	(d) **Thickness**	(e) **Lithologic Description**
Richmond Group	Ordovician	90	446	limestone, shale
Cynthiana	Ordovician	536	102	limestone
Trenton	Ordovician	638	28	limestone
Black River	Ordovician	666	294	limestone
Chazy	Ordovician	960	192	limestone
St. Peter	Ordovician	1152	20	sandstone
Chepultepec	Cambrian	1172	460	dolomite
Copper Ridge	Cambrian	1632	732	dolomite
Conasauga	Cambrian	2364	144	shale
Rome	Cambrian	2508	338	
Shady	Cambrian	2846	108	dolomite
Mt. Simon	Cambrian	2954		sandstone

WIC OH-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2940	300
(3) Thickness (Ft.)	339	2600
(4) Formation Fluid Pressure, psi	1200	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	Ordovician-Cambrian
(8) Porosity %	7 - 14	
(9) Permeability, millidarcies	66 - 524	
(10) Reservoir Temperature, °C	30°	
(11) Character and Areal Distribution	sandstone widespread	limestone, shale widespread

C. Chemical Characteristics of Formation Fluids: TDS = 189,000 ppm; Cl^- = 110,000; Na = 40,000; Ca = 20,400

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Maximum - 1% HCl, 25% $FeCl_2$, 1.5% $FeCl_3$

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 9 - 15
   - B. Conc. Dissolved Solids, mg/l: 250,000
   - C. Specific Gravity: 1.16 - 1.18
   - D. Temperature: 100° - 150° F
   - E. pH: less than 1.0

WIC OH-3

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Corrosive; surface equipment designed to resist attack.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Filtration by pressure leaf type filter capable of removing suspended solids larger than 2 microns.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		48# H-40	13-3/8	298
Intermediate		36# J-55	9-5/8	2946
Injection		Epoxy chemical tubing	3-1/2	2915
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 inch casing - 300 sks cement.

3. **Well Head Equipment (Name and Models):** National tubing hanger type "E".

4. **Packers, Centralizers, and Other Subsurface Equipment:** Seal - Baker model 80-40 mod. G with 3-1/2 x 6-1/4 slim hole centralizers; packer - model D

5. **Bottom Hole Completion:** Open hole.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Buffer zone - 3,000,000 gallons of fresh water.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Two 75,000 gal. holding tanks.

2. **Filters:** Two vertical pressure leaf with diatomaceous earth precoat rate at 0.5 gpm/ft^2.

WIC OH-3

3. **Pumps:** 2 - centrifugal transfer pumps rated 100 gpm; 1 - triplex plunger pump rated 100 gpm.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	5/69	Average	3	Maximum	
"	5/70		44		
"	5/71		47		
"	6/72		67		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	5/69	Average	150	Maximum	
"	5/70		10		
"	5/71		40		
"	6/72		80		

3. Annual Volume Injected, gal.
A. 1972 12,531,094 B. 1971 9,571,271 C. 1972 13,722,831

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous rate/pressure recorder, annulus pressure checked periodically, tubrimeter.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner which will prevent pollution.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: OH-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Vistron Corporation
Lima, Ohio

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 09 **(Year)** 73
2. **Latitude and Longitude:** 40°42'/84°
3. **Well Location (Legal Description):** 130 ft. FSL and 72 ft. FEL of SE 1/4, Sec 2, Shawnee Twp.
4. **County:** Allen **State:** Ohio
5. **SIC Classification:** 2810

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Acrylonitrile and methacrylonitrile production wastes.
2. **Date Well Permitted:** 1/11/68 **Completed:** 2/11/68
3. **Injection Rate:** 37,650,000 gpy
4. **Injection Pressure:** 776 psi
5. **Total Depth of Well:** 3133 ft.
6. **Name, Age, and Depth of Injection Zone:** Mt. Simon, Cambrian 2780 ft.
7. **Date Injection Began: (Day)** 05 **(Month)** 07 **(Year)** 68
8. **Total Volume Injected to Date:** 310,789,318 (3/31/73) **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Incineration and bio-treatment.

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	32	sand, gravel, clay
Cayugan	Silurian	32	178	
Lockport	Silurian	210	198	
Medina - Clinton	Silurian	408	185	sandstone, shale
Reedsville	Silurian	593	659	
Trenton	Ordovician	1252	42	dolomite
Eggleston-Gull River	Ordovician	1294	515	limestone
Glenwood	Cambrian	1809	2	shale
Trempealeau	Cambrian	1811	471	dolomite
Maynardville	Cambrian	2282	116	dolomite
Conasauga-Shady	Cambrian	2398	282	shale, dolomite
Mt. Simon	Cambrian	2780	352	sandstone

WIC OH-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	Gleenwood-Shady
(2) Depth (Ft.)	2780	1809
(3) Thickness (Ft.)	352	971
(4) Formation Fluid Pressure, psi	1100	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	Cambrian
(8) Porosity %	14.4	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	29°	
(11) Character and Areal Distribution	Sandstone widespread	Shale, dolomite widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonia, sulfate, organic acids, and nitriles.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 66
   B. Conc. Dissolved Solids, mg/l: 39,000
   C. Specific Gravity: 1.06 - 1.12
   D. Temperature: N/A
   E. pH: 4.0 - 6.5

(b)

3. **Toxicity:** All constituents could be considered toxic.

4. **Reactivity with Surface Equipment Components:** Corrosive due to presence of organic acids.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; possible transformations of organics and nitrogen compounds by bacteria.

7. **Pre-injection Waste Treatment:** Surge pond (2.5 million gallons) for equalization and settling of solids; filtration through sand filters; waste waters run through heat exchangers to cool waste.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	32.75# H-40	10-3/4	434
Intermediate	9	20# J-55	7	2782.5
Injection	8-3/4	9.3# J-55	3-1/2	2778.2
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4" casing - 125 sks 50-50 Pozmix, 2% gel, 600# Gilsonite; 7" casing - 1st stage= 300 sks Pozmix, 1% CFR-2, 18% salt gel, 100 sks Type II cement, 1-1/4% CFR-2, 18% gel: 2nd stage= 100 sks Pozmix, 1% CFR-2, 1-1/4% Flocele, 350 sks Pozmix.

3. **Well Head Equipment (Name and Models):** National type "E" tubing, head 6" nominal, 2-2" line pipe putlets, 1-#516411 body, 1-#516375 CAP, 1-#516349-A type H-4E slip-packing type tubing hanger.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker "AC" packer at 2782 ft.

5. **Bottom Hole Completion:** Open hole completion - 2782 to 3133 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Well treated three times with dilute acetonitrile to improve injection.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Carbon steel, 2 - 300 barrel surge tanks

2. **Filters:** 6 pressure sand filters

WIC OH-4

3. Pumps: J-531-L Armco triplex plunger pump, 150 HP.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	7/69	Average	160	Maximum	
"	7/70		155		
"	7/71		164		
"	7/72		121		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	7/69	Average	1032	Maximum	
"	7/70		1015		
"	7/71		485		
"	7/72		782		

3. Annual Volume Injected, gal.
A. 1972 37,648,290 B. 1971 59,927,160 C. 1970 93,620,400

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Injection and annulus pressure - 24 hr/day monitoring and recording, hi-lo alarms; injection temperature - 24 hr/day recording; totalizing flow meters.

B. Sampling Frequency and Water Quality Parameters Measured: None

C. Frequency of Measuring Water Levels and Hydrostatic Heads: None

2. Contingency Plan for Well Failure During Operation: Shut down immediately and valve in , use alternate wells or incinerate.

3. Regulatory Aspects

A. Construction Requirements: Casing and integral cement job required.

B. Monitoring Requirements: Injection and annulus pressures; flow rate to well; total volume pumped.

C. Restrictions of Operation Procedures: Injection pressure limited to 840 psi.

Well Id. Code: OH-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: USS Chemical, Division of US Steel
Haverhill, Ohio

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 04 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): 7360 ft. FSL and 5550 ft. FWL of Green Twp.
4. County: Scioto State: Ohio
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Oxidation of cumene hydroperoxide and its subsequent cleavage into phenol, acetone, and alpha methyl styrene production water.
2. Date Well Permitted: 4/30/68 Completed: 7/5/68
3. Injection Rate: 168 gpm
4. Injection Pressure: 1000 psi
5. Total Depth of Well: 5617 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 5514 ft.
7. Date Injection Began: (Day) 01 (Month) 10 (Year) 69
8. Total Volume Injected to Date: 131,888,327 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC OH-5

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	5514	
(3) Thickness (Ft.)	66	
(4) Formation Fluid Pressure, psi	2633	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	4500	
(7) Age of Unit	Cambrian	
(8) Porosity %	11.9	
(9) Permeability, millidarcies	26.8	
(10) Reservoir Temperature, °C	41°	
(11) Character and Areal Distribution	sandstone widespread	

C. Chemical Characteristics of Formation Fluids: TDS = 316,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste water containing phenol, acetone, cumene hydroperoxide, sodium formate, and sodium sulfate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 120° F
   E. pH: N/A

3. **Toxicity:** Total dose of 1.5 grams of phenol may be fatal to humans.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-3/4	32.75# H-40	10-3/4	473
Intermediate	8-3/4	26# N-80	7	5594
Injection		9.3# EUE N-80	3-1/2	5519
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 260 sks; 7 inch casing - 2470 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer @ 5422 ft.; annulus fluid - inverted oil emulsion mud.

5. **Bottom Hole Completion:** Set through sand, perforated, notched, and fraced @ 5517 to 5599 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acid fracture with 6% HF and 9% HCl, 25,000 gal water and 30,000# 20-40 sand at 1710 gpm.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC OH-5

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/69	Average	100	Maximum	
"	7/70		82		
"	7/71		89		
"	7/72		57		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/69	Average	1250	Maximum	
"	7/70		1650		
"	7/71		1500		
"	7/72		1400		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped, and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: OH-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Vistron Corporation
Lima, Ohio

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 73
2. Latitude and Longitude: 40°42'/84°
3. Well Location (Legal Description): 448.26 ft. FNL and 114.24 ft. FWL of NE 1/4 of Sec 11, Shawnee Twp.
4. County: Allen State: Ohio
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Acrylonitrile and methacrylonitrile production waste.
2. Date Well Permitted: 6/27/69 Completed: 7/19/69
3. Injection Rate: 107,000,000 gpy
4. Injection Pressure: 680 psi
5. Total Depth of Well: 3171 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 2760 ft.
7. Date Injection Began: (Day) 14 (Month) 10 (Year) 70
8. Total Volume Injected to Date: 310,009,501 (3/31/73) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Incineration and bio-treatment

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC OH- 6

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	Glenwood-Shady
(2) Depth (Ft.)	2760	1800
(3) Thickness (Ft.)	384	900
(4) Formation Fluid Pressure, psi	1188	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	Cambrian
(8) Porosity %	14	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	29°	
(11) Character and Areal Distribution	sandstone widespread	shale, dolomite widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonia, sulfate, organic acids, and nitriles.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 66
   B. Conc. Dissolved Solids, mg/l: 39,000
   C. Specific Gravity: 1.06 - 1.12
   D. Temperature: 90° F
   E. pH: 4.0 - 6.5

3. **Toxicity:** All constituents could be toxic

4. **Reactivity with Surface Equipment Components:** Possible corrosion from organic acids.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Possibly not sterile at injection; possible bacterial transformations of organics and nitrogen compounds.

7. **Pre-injection Waste Treatment:** Settling of solids, filtration, and heat exchange.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4	H-40 Class A	10-3/4	504
Intermediate	9	20# Grade K	7	2811'
Injection	9	11.6# Grade K	4-1/2	2808.69
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4" casing - 400 sks common class A, 4% gel,5% $CaCl_2$, 12# Gilsonite/sack; 7" casing - 250 sks Halliburton light 18% salt, 100 sks #2, 18% salt, 1-1/4% CFR-2 + 200 sks light, 18% salt, 50 sks light, 18% salt, 10# Gilsonite/sack

3. Well Head Equipment (Name and Models): 4-1/2" x 7" Larkin tubing head.

4. Packers, Centralizers, and Other Subsurface Equipment: Paker model "AG" tension packer at 2808.69 ft.

5. Bottom Hole Completion: Open hole completion - 2808.69 to 3171 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two 300 barrel surge tanks

2. Filters: 6 pressure sand filters

WIC OH-6

3. **Pumps:** J-531-L Armco triplex plunger pump, 150 HP

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
10/69	173	
10/70	199	
7/71	174	
7/72	200	

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
10/69	588	
10/70	571	
7/71	708	
7/72	722	

3. **Annual Volume Injected, gal.**

A. 1972 107,782,557 B. 1971 94,001,958 C. 1970 18,374,400

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Injection and annulus pressures - 24 hr/day monitoring and recording, hi-lo alarms; injection temperature - 24 hr/day recording; total flow.

B. **Sampling Frequency and Water Quality Parameters Measured:** None

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** None

2. **Contingency Plan for Well Failure During Operation:** Shut down well and incinerate waste or pump to another well.

3. **Regulatory Aspects**

A. **Construction Requirements:** Casing and integral cement required.

B. **Monitoring Requirements:** Injection and annulus pressure; flow rate to well; total volume pumped.

C. **Restrictions of Operation Procedures:** Injection pressure limited to 840 psig.

Well Id. Code: OH-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN
Operating Company Name and Address: Calhio Chemicals, Division of Stauffer
Perry Village, Ohio

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 04 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Lake State: Ohio
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from the manufacture of agricultural fungicides (captan, phalton)
2. Date Well Permitted: 2/11/71 Completed: 4/9/71
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 6972 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 5930 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	3928	
(3) Thickness (Ft.)	132	
(4) Formation Fluid Pressure, psi	2716	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	Devonian-Cambrian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	50°	
(11) Character and Areal Distribution	sandstone widespread	shale, carbonate, sandstone widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chloroform solubles - 3000 ppm; MEK solubles - 1200 ppm; COD - 4000 ppm; NaCl - 25 ppm; Na SO - 2000 ppm; Hexane solubles - 10 ppm

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: 0

B. Conc. Dissolved Solids, mg/l: N/A

C. Specific Gravity: 1.025

D. Temperature: N/A

E. pH: 7.0 - 7.5

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4	32.75#	10-3/4	512
Intermediate	9-1/2	26# J-55	7	5950
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC OH-7

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: OH-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: International Salt Co., Whiskey Island
Cleveland, Ohio

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 02 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Brooklyn Twp. Lot 51
4. County: Cuyahoga State: Ohio
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Brine seepage from a mine shaft.
2. Date Well Permitted: 6/1/71 Completed: 8/3/71
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 1435 ft.
6. Name, Age, and Depth of Injection Zone: Oriskany, Devonian 1335 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC OH-8

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Oriskany	Ohio
(2) Depth (Ft.)	1335	
(3) Thickness (Ft.)	52	1300
(4) Formation Fluid Pressure, psi	565	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies	610	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): TDS @110°F - 276,530 ppm; total sulfides (as H_2S) - 761 ppm; Ca - 34,303 ppm; Mg - 8,674 ppm

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.164
   D. Temperature: N/A
   E. pH: 5.5

WIC CH-8

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		J-55	5-1/2	300
Intermediate		EVE J-55	2-7/8	1330
Injection		Stainless Steel	2	1335
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 5-1/2" casing - cemented to surface; 2-7/8" casing - 180 sks Pozmix to surface.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC OH-8

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: OH-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Vistron Corporation
Lima, Ohio

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): 1052 ft. FSL and 1068 ft. FWL of SE 1/4 of Sec 2, Shawnee Twp.
4. County: Allen State: Ohio
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Acrylonitrile and methacrylonitrile production wastes.
2. Date Well Permitted: 7/12/71 Completed: 3/16/72
3. Injection Rate: N/A
4. Injection Pressure: 552 psi
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 2780 ft.
7. Date Injection Began: (Day) 08 (Month) 08 (Year) 72
8. Total Volume Injected to Date: 18,338,210 (3/31/73) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Incineration, bio-treatment.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OH-9

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	Glenwood-Shady
(2) Depth (Ft.)	2780'	1800
(3) Thickness (Ft.)	386'	900
(4) Formation Fluid Pressure, psi	1320	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	Cambrian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandstone widespread	shale and dolomite widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC OH-9

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Settling of solids, filtration, heat exchange.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/8	Casing	10-3/4	513
Intermediate	9	Casing	7	2804
Injection	9	Tubing	4-1/2	2793
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4" casing: 235 sks; 7" casing: 550 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker tension type packer.

5. **Bottom Hole Completion:** Open hole completion - 2793' to 3166'

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Carbon steel; 2-300 bbl. surge tanks.

2. **Filters:** 6 pressure and filters.

WIC OH-9

3. **Pumps:** J-531-L Armco Triplex Plunger Pump, 150 Hp.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
12/72	168	
" 3/73	191	
"		
"		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
12/72	571	
" 3/73	543	
"		
"		

3. **Annual Volume Injected, gal.**
A. 1972 8,721,980 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Injection and annulus pressures - 24 hr./day, monitoring and recording, hi-lo alarms; injection temp. - 24 hr./day recording; totalizing flow meters.

B. **Sampling Frequency and Water Quality Parameters Measured:** Temperature recorded; no sampling.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** Shut down immediately and valve in; dispose of waste via alternate disposal wells or incinerate.

3. **Regulatory Aspects**

A. **Construction Requirements:** Casing and integral cement job required.

B. **Monitoring Requirements:** Injection and annulus pressure; flow rate, total volume.

C. **Restrictions of Operation Procedures:** Injection pressure limited to 840 psi.

Well Id. Code: OK-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: Macklanburg - Duncan Co.
Box 25188, Oklahoma City, Oklahoma

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 35°32'00"/97°15'40"
3. Well Location (Legal Description): NE 1/4, SE 1/4, Sec 16, T12N, R3W
4. County: Kingfisher State: Oklahoma
5. SIC Classification: 2400

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Building products manufacture wastes.
2. Date Well Permitted: 7/29/71 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OK-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC OK-1

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: ______

Well Id. Code: OK-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Nipak, Inc.
P.O. Box 338 - Pryor, Oklahoma 74361

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 73
2. Latitude and Longitude: 36°15'30"/95°16'50"
3. Well Location (Legal Description): NW 1/4, SE 1/4, Sec. 33, T21N, R19E
4. County: Mayes State: Oklahoma
5. SIC Classification: 2871

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of ammonia fertilizer wastes.
2. Date Well Permitted: 10/19/66 Completed:
3. Injection Rate: 700 gpm
4. Injection Pressure: 390 psi.
5. Total Depth of Well: 530
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 397
7. Date Injection Began: (Day) 26 (Month) 10 (Year) 66
8. Total Volume Injected to Date: (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Hindsville	Mississippian	0	54	
Moorefield	Mississippian	54	64	
Keakuk	Mississippian	108	164	
Reed Springs	Mississippian	164	126	Cherty limestone
Chattanooga	Mississippian	290	55	shale
Simpson	Mississippian	345	7	sandstone
Arbuckle	Ordovician	397	133	dolomite

(a)

WIC OK-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	Chattanooga
(2) Depth (Ft.)	397	290
(3) Thickness (Ft.)	133	55
(4) Formation Fluid Pressure, psi	250	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Ordovician	Mississippian
(8) Porosity %	Small pores to vugs	
(9) Permeability, millidarcies	112	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite, widespread	shale, widespread

C. Chemical Characteristics of Formation Fluids: 21,670 ppm Cl, 1,957 ppm Ca, 10,000 ppm Na, 870 ppm Mg, 827 ppm SO_4, 87ppm H_2S

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: No minerals are reported.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Water and trace amounts of ammonia, urea, chromate, sodium chloride, and calcium sulfate, volume - 370,000 gpd,30 ppm CrO_4, 2.5 ppm Fe, 60 ppm Cl.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.00
   D. Temperature: ambient
   E. pH: 9.2

WIC OK-2

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Skimming and sedimentation.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface Intermediate	12-1/2	J-55 24#	8-5/8	397
Injection		J-55 9.5#	4-1/2	390
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 600 sks. common circulated to surface.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer @ 384 ft. (Brown M-1 Retrievable) - CrO_3 @ 4000 ppm 9.0 pH in annulus.

5. **Bottom Hole Completion:** Open hole 8" @ 530' 6" @ 530 - 789'

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with weak acid (HCl) 8000 gal. 15% HCl; buffer injection - 8.5 million gal. of fresh water.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Diked pond 350' x 600' x 12'

2. **Filters:** N/A

WIC OK-2

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	12/71	**Average**	353	**Maximum**	700
"	Initial		890		
"	Current		700		
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	12/71	**Average**	390	**Maximum**	420
"	Initial		100		
"	Current		335		
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Continuous rate and pressure recorders of the injected liquid.

B. **Sampling Frequency and Water Quality Parameters Measured:** Analysis of four fresh water wells semi-annually.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** Completed to protect ground water and natural resources.

B. **Monitoring Requirements:** must monitor pump pressure, annulus pressure, chemical and physical nature of waste.

C. **Restrictions of Operation Procedures:** Maximum injectin pressure = 430 psi.

Well Id. Code: OK-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Nipak, Inc.
P.O. Box 338 - Pryor, Oklahoma 74361

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 07 **(Year)** 73
2. **Latitude and Longitude:** 36°15'30"/95°16'50"
3. **Well Location (Legal Description):** SE 1/4, NW 1/4, Sec. 23, T21N, R19E
4. **County:** Mays **State:** Oklahoma
5. **SIC Classification:** 2871

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Manufacture of ammonia fertilizer wastes.
2. **Date Well Permitted:** 4/55 **Completed:**
3. **Injection Rate:** 200,000 gpd
4. **Injection Pressure:** 390
5. **Total Depth of Well:** 820'
6. **Name, Age, and Depth of Injection Zone:** Arbuckle, Ordovician
7. **Date Injection Began: (Day)** **(Month)** **(Year)** 55
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Hindsville	Mississippian	0	54	
Moorevield	Mississippian	54	64	
Keakuk	Mississippian	108	164	
Reed Springs	Mississippian	164	126	Cherty limestone
Chattanooga	Mississippian	290	55	Shale
Simpson	Mississippian	345	7	sandstone
Arbuckle	Ordovician	358	462	dolomite

WIC OK-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	Chattanooga
(2) Depth (Ft.)	358	290
(3) Thickness (Ft.)	462	55
(4) Formation Fluid Pressure, psi	250	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Ordovician	Mississippian
(8) Porosity %	Small pores to vugs	
(9) Permeability, millidarcies	112	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Massive limestone widespread	shale, widespread

C. **Chemical Characteristics of Formation Fluids:** 21,670 ppm Cl, 1,957 ppm Ca, 10,000 ppm Na, 870 ppm Mg, 827 ppm SO_4, 87 ppm H_2S.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. **Mineral Resources in Area:** No minerals are reported.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Water and trace amounts of ammonia, urea, chromate, sodium chloride, and calcium sulfate volume - 370,000 gpd. 30 ppm CrO_4, 2.5 ppm Zn, 60 ppm Cl.

2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.00
   - D. Temperature: Ambient
   - E. pH: 6.6

WIC OK-3

3. **Toxicity:** Chromate concentration is toxic to some species at this level.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Sufficient nutrients to support biological growth with the pH of 6.6.

7. **Pre-injection Waste Treatment:** Skimming and sedimentation.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate	12-1/2	J-55 24#	8-5/8	397
Injection	J-55 9.5#		4-1/2	390
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 600 sks common circulated to surface.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Brown M-1 Retrievable Packer @ 384 ft. - Annulus filled with 4000 ppm CrO_3, pH - 9.0.

5. **Bottom Hole Completion:** Open hole 8" @ 530' 6" @ 530 - 789'

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 8,000 gal. 15% HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Diked pond 350' x 600' x 12'

2. **Filters:** N/A

WIC OK-3

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	5/71	Average	225	Maximum	700
"	10/31/72		95		
"	10/14/72		105		
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	5/71	Average	380	Maximum	420
"	10/31/72		50		
"	10/14/72		130		
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: 4 fresh water wells reported semi-annually daily continuous rate - pressure recorders.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Protect groundwater and other resources.

B. Monitoring Requirements: Monitor pressure and waste character.

C. Restrictions of Operation Procedures: Maximum pump discharge limitation - 450 psi.

Well Id. Code: OK-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: North American Rockwell Corporation
3330 North Mingo Road - Tulsa, Oklahoma 74116

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 36°11'30"/95°52'40"
3. Well Location (Legal Description): SW 1/4, SE 1/4, NE 1/4, Sec. 24, T20N, R13E
4. County: Tulsa State: Oklahoma
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Rinse water from pre-bond processing line (effluent contains hexavalent chromium).
2. Date Well Permitted: 10/67 Completed:
3. Injection Rate: 28,539 gal./day
4. Injection Pressure: 275 psi
5. Total Depth of Well: 3100
6. Name, Age, and Depth of Injection Zone: Arbuckle and Regan Ordovician 1800-3000
7. Date Injection Began: (Day) (Month) 02 (Year) 68
8. Total Volume Injected to Date: 10,277,961 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Verdigris	Pennsylvanian	422		Limestone
Skinner thru	Pennsylvanian	460		Limestone, shale, sandstone
Fayetteville	Mississippian	1446		Limestone and shale
Woodford	Devonian	1670		Shale
Turner	Ordovician	1722		Sandstone
Arbuckle	Ordovician	1800	1190	Dolomite
Regan	Cambrian	2990	110	Sandstone
Basement	Pre-Cambrian	3100		Granite

WIC OK-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle Regan	
(2) Depth (Ft.)	1800 2990	
(3) Thickness (Ft.)	1190 110	
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	800 psi	
(7) Age of Unit	Ordovician Cambrian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone sandstone dolomite regionally distributed	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Oil and gas are extensively produced in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 200-ft. monitoring well.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chloride, phenol, copper, gold.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC OK-4

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4		10-3/4	417
Intermediate	8-3/4	J-55	7	1806
Injection		Fiberglass	2-7/8 I.D.	1825
Other		Carpentar (bottom of 7" casing)		1796-1806

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4" casing - 286 sks. reg. portland, circulated to surface; 7" casing - 325 cu. ft. Poxmix and light cement circulated to surface.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker Model A tension packer constructed of Carpentar 20 alloy and a soft Hycar element Packer set in the 10 ft. joint of Carpentar 20 7 inch casing.

5. **Bottom Hole Completion:** Open hole completion from 1800 ft. to T.D.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 1000 gal. 15% HCl 42 gpm @ 150 psi and 10,000 gal. 15% HCl 500 gpm @ 150 psi.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 100,000 gal. horizontal, above ground, storage tank.

2. **Filters:** N/A

WIC OK-4

3. **Pumps:** 2 - 300 gpm @ 150 psi centrifugal pumps.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		**Average**		**Maximum**	
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	9/72	**Average**	175	**Maximum**	300
"	4/72		275		
"	3/71		275		
"					

3. **Annual Volume Injected, gal.**
A. 1972 7,715,441 B. 1971 4,010,576 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Well annulus is equipped with high pressure alarm.

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** None at time of construction. However, the OWRB has issued technical order No. 200-1 which becomes effective 11/14/72.

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: OK-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDC **Operational Status:** NOUP

Operating Company Name and Address: United States Pollution Control, Inc.
2000 Classen Center, Suite 2000 South
Oklahoma City, Oklahoma 73106

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 36°08"20"/97°53'30"
3. **Well Location (Legal Description):** SE 1/4, SE 1/4, Sec. 1, T19N, R7W
4. **County:** Kingfisher **State:** Oklahoma
5. **SIC Classification:** 4952

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Five trucking firms discharge liquid wastes from various industries - primarily salt water from oil and gas industry.
2. **Date Well Permitted:** 5/66 **Completed:**
3. **Injection Rate:** 940,000 gpd
4. **Injection Pressure:** 1300 psi
5. **Total Depth of Well:** 5625 ft.
6. **Name, Age, and Depth of Injection Zone:** Pennsylvanian, 3529 ft.
7. **Date Injection Began: (Day)** **(Month)** 08 **(Year)** 66
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Topeka	Pennsylvanian	3591	100	limestone
Hoover	Pennsylvanian	3695	449	sand
Le Compton	Pennsylvanian	4144	581	limestone
Endicott	Pennsylvanian	4725	845	sand
Cottage Grove	Pennsylvanian	5570	145	sand

(a)

WIC OK-5

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Topeka	
(2) Depth (Ft.)	3529	
(3) Thickness (Ft.)	2041	
(4) Formation Fluid Pressure, psi	2100	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pennsylvanian	Pennsylvanian
(8) Porosity %	9	
(9) Permeability, millidarcies	250	
(10) Reservoir Temperature, °C	40°	
(11) Character and Areal Distribution	limestone	shales, sandstones and limestones

C. Chemical Characteristics of Formation Fluids: 115,000 ppm Cl, 9000 ppm Ca, 38 ppm SO_4, Sp. Gr. 1.105, viscosity-0.65 cp, pH-6.5

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: No minerals resources are reported in the vicinity of the well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 216 ppm Cl, 0.075 ppm phenols, 10 ppm Ca, 1 ppm Ag, viscosity 0.38 cp.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.054
   D. Temperature: 60°F
   E. pH: 3.98

WIC OK-5

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Possible problems caused by acidic nature of the waste.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	J-55 24#	8-5/8	404
Intermediate	7-7/8	J-55 11.6#	4-1/2	5570
Injection		J-55 6.4#	2-7/8	3529
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 450 sks cement; 7-7/8 inch casing - 675 sks cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker Lok - set C retrievable Packer @ 3529 ft. - Centralizers every 100 ft. from 3370-5570 ft.

5. **Bottom Hole Completion:** Perforated completion.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 500 gal. of 15% HCl, 10,000 bbl fresh water.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 55,000 gal. stabilizing pond for emergency use.

2. **Filters:** N/A

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: 3 to 5 pressure and rate readings daily.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: OK-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: U.S. Pollution Control Inc.
2000 Classen Center, Suite 2000 South
Oklahoma City, Oklahoma 73106

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 36°06'00"/97°51'30"
3. **Well Location (Legal Description):** SW 1/4, NW 1/4, Sec. 29 T18N, R6W
4. **County:** Kingfisher **State:** Oklahoma
5. **SIC Classification:** 4952

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Five trucking firms discharge liquid wastes from various industries.
2. **Date Well Permitted:** 1/11/72 **Completed:**
3. **Injection Rate:** 20,000 gpd
4. **Injection Pressure:** 460 psi
5. **Total Depth of Well:** 7693 ft.
6. **Name, Age, and Depth of Injection Zone:** Mississippi, 7173 ft.
7. **Date Injection Began: (Day)** 02 **(Month)** 04 **(Year)** 72
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Topeka	Pennsylvanian	3591	100	limestone
Hoover	Pennsylvanian	3695	449	sand
Le Compton	Pennsylvanian	4144	581	limestone
Endicott	Pennsylvanian	4725	845	sand
Cottage Cove	Pennsylvanian	5570	145	sand

WIC OK-6

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	7173	near surface
(3) Thickness (Ft.)	520	7000
(4) Formation Fluid Pressure, psi	2700	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Mississippian	Pennsylvanian
(8) Porosity %	3	
(9) Permeability, millidarcies	5-200	
(10) Reservoir Temperature, °C	54°	
(11) Character and Areal Distribution	limestone dolomite	shale, limestone and sandstone

C. Chemical Characteristics of Formation Fluids: Cl - 128,000 ppm Ca - 10,145 ppm, Sulfates - 575 ppm, Sp. gr. - 1.109, Vixcosity - 0.063cp pH - 8.5 TDS - 205,000 ppm.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 2 - 7% chromic, 2 - 5% sulfuric acid, 5 - 10% caustic solutions, 2 - 12% nitric acid.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.15
   D. Temperature: ambient
   E. pH: 1-9

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Sacrificial anodes, tubing plastic coated (600), rubber lining or stainless steel (316).

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Oil overflow tank.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	J-55, 24#	8-5/8	198
Intermediate	7-7/8	J-55, 14 & 15.5#	5-1/2	7088
Injection		J-55, NUE 4.6#	2-7/8	5900
Other	7-7/8	slotted liner J-55 NUE 912#	3	6968 - 7173

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 casing - 200 sx regular + 2% $CaCl_2$, HA-5; 5-1/2 casing - 200 sx Pozmix (A) Neat (2) + 2% gel, 1/4 of 1% CFR.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer Model A (Plastic-coated) SA 5900'; Baker Differential fill-up float shoe on bottom 5-1/2" casing with centralizers on bottom of both casing strings, or one every 100' (1000') on long string.

5. **Bottom Hole Completion:** Open hole (7-7/8") w/190' - 3" slotted liner.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 1000 gal. 15% inhibited hydrochloric acid; fractured - 9000 bbl. fresh water at injection rate of 60 BPM at 200-400 psig.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 4 - 210 bbl tanks; 2 - 400 bbl tanks; 1 - 130 bbl oil storage overflow.

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Initial	**Average**	350 8	**Maximum**	12
"	Current 10/71		600 15		24
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Initial	**Average**	Vacuum	**Maximum**	Vacuum
"	10/71		90		175
"	6/72		460		425
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Flow and pressure monitors.

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** 1 - 400 bbl emergency overflow.

3. **Regulatory Aspects**

A. **Construction Requirements:** N/A

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Maximum injection pressure limitation - 1300 psi.

Well Id. Code: OK-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: U.S. Pollution Control, Inc.
200 Classen Center, Suite 2000 South
Oklahoma City, Oklahoma 73106

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 74
2. Latitude and Longitude: 36°03'30"/95°58'00"
3. Well Location (Legal Description): NE 1/4, SW 1/4, Sec. 1, T18N, R12E
4. County: Tulsa State: Oklahoma
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: 10/63 Completed:
3. Injection Rate: N/A
4. Injection Pressure: Vacuum
5. Total Depth of Well: 3359
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician-Cambrian 3359
7. Date Injection Began: (Day) 15 (Month) 04 (Year) 72
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	3359	
(3) Thickness (Ft.)	1112	
(4) Formation Fluid Pressure, psi	825	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician-Cambrian	
(8) Porosity %	2 - 11	
(9) Permeability, millidarcies	200	
(10) Reservoir Temperature, °C	41°	
(11) Character and Areal Distribution	limestone dolomite	

C. Chemical Characteristics of Formation Fluids: Cl - 113, 000 ppm, Ca - 14,250 ppm, Sulfates - 125 ppm, Na - 47,300 pm, sp. gr. 1.100, pH - 7.4.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sulfates = 2 - 7% Cr = 2 - 5% caustic (NaOH) = 1 - 6%, Nitric = 2 - 5%.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.15
   D. Temperature: N/A
   E. pH: N/A

WIC OK-7

3. **Toxicity:** HNO dangerous at 15-30 mg/1, Cr++ limited to 0.05 mg/1, sulfuric acid may be harmful through pH shifts.

4. **Reactivity with Surface Equipment Components:** Tubing lines w/PVC fiberglass or rubber lined lining.

5. **Degradability Level and Rate:** Breakdown of acidic components.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal due to lack of substrate and unfavorable pH of environment.

7. **Pre-injection Waste Treatment:** Sedimentation of a sludge.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	H-40 32.75#	10-3/4	83
Intermediate	9-3/4	J-55 28.00#	8-5/8	1543
	7-7/8	J-55 15.50#	5-1/2	2138
Injection	7-7/8	J-55 4.70#	2-3/8	2150
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 casing - 100 sx Neat + 2% $CaCl_2$; 8-5/8 casing - 225 sx 50/50 Pozmix A & Gel LCM & $CaCl_2$; 5-1/2 casing - 150 sx 50/50 Poz A & Gel LCM & $CaCl_2$.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Centralizers: one each on bottom of surface and intermediate strings and 3 bottom of long string. Differential fill-up shoe (5-1/2"). Model AD Baker Packer (Plastic coated).

5. **Bottom Hole Completion:** N/A

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 6000 gal. 15% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC OK-7

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Plan to install a pressure recorder on both tubing and annulus.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Injection pressure limitations - 800 psi.

Well Id. Code: OK-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: DN
Operating Company Name and Address: Ozark - Mahoning Co.
1870 S. Boulder, Tulsa, Oklahoma

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 36°07'48"/96°03'24"
3. Well Location (Legal Description): SE 1/4, SE 1/4, Sec 8, T19N, R12E
4. County: Tulsa State: Oklahoma
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of sulfuric acid and dentrifrice additives.
2. Date Well Permitted: 8/8/72 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Arbuckle,Ordovician
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OK-8

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l:
   - C. Specific Gravity:
   - D. Temperature:
   - E. pH:

(b)

WIC OK-8

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: OK-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Cherokee Nitrogen Company
Pryor, Oklahoma 74361

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 34°14'20"/95°16'40"
3. Well Location (Legal Description): SE 1/4, NW 1/4, Sec. 3 T20N, 419E
4. County: Mayes State: Oklahoma
5. SIC Classification: 2800

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of ammonium nitrate - chromates, ammonium and organic nitrogen, nitrate wastes.
2. Date Well Permitted: 6/67 Completed:
3. Injection Rate: 120 gpm
4. Injection Pressure: 200 psi
5. Total Depth of Well: 912
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 450-950 ft.
7. Date Injection Began: (Day) 15 (Month) 06 (Year) 67
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OK-9

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Arbuckle	
(2)	Depth (Ft.)	395	
(3)	Thickness (Ft.)	517	
(4)	Formation Fluid Pressure, psi	200	
(5)	Lithostatic Pressure, psi		
(6)	Hydrofracturing Pressure, psi		
(7)	Age of Unit	Ordovician	
(8)	Porosity %		
(9)	Permeability, millidarcies		
(10)	Reservoir Temperature, °C	29°	
(11)	Character and Areal Distribution	limestone	

C. Chemical Characteristics of Formation Fluids: 37,922 ppm TDS, 23,049 ppm Cl, Sp.Gr. 1.026, pH 9.5

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: No mineral resources reported.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chromates, ammonia and organic nitrogen, sulfate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 1044
   C. Specific Gravity: N/A
   D. Temperature: 80 to 105° F
   E. pH: 7.0 - 8.4

WIC OK-9

3. **Toxicity:** Recommended Cr++ levels 0.05 mg/1;SO_4 should not exceed 500 mg/1.

4. **Reactivity with Surface Equipment Components:** Probably none.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, bacterial activity probably minimal.

7. **Pre-injection Waste Treatment:** Waste stabilization pond.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			14	125
Intermediate		20# and 23#	10	415
			7	452
Injection			3	421.35
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-inch casing - 150 sks. 50 - 50 Pozmix w/2% $CaCl_2$

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Halliburton R-4 plastic lined packer 7" at 425.65.

5. **Bottom Hole Completion:** Open hole completion 9 inch opening.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 1500 gal. 15% HCl w/Hy-ckan added;fractured - 12 bbl per. min. @ 800 to 850 psi.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Lined holding pond.

2. **Filters:** N/A

WIC OK-9

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Two shallow observation wells.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Maximum surface injection pressure is limited to 350 psi.

Well Id. Code: OK-10

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Halliburton Services
Duncan, Oklahoma 73533

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 07 (Year) 73
2. Latitude and Longitude: 34°29'00"/97°58'20"
3. Well Location (Legal Description): NE 1/4, SE 1/4, Sec. 7, T1S, R7W
4. County: Stephens State: Oklahoma
5. SIC Classification: 1389

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Effluent from petroleum well services plant - consists of fresh water and cement slurries.
2. Date Well Permitted: 9/31/70 Completed:
3. Injection Rate: 200,770 gpy
4. Injection Pressure: 1100 psi
5. Total Depth of Well: 1272
6. Name, Age, and Depth of Injection Zone: Permian, 1224
7. Date Injection Began: (Day) 23 (Month) 09 (Year) 73
8. Total Volume Injected to Date: 424,362 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Previous disposal well at 342 feet was used to prove technique for deeper current well.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

WIC OK-10

B. **Geologic Description of Injection Unit and Other Possible Units**

	Injection Unit	Confining Bed
(1) Name	Red Beds	
(2) Depth (Ft.)	1224	
(3) Thickness (Ft.)	17	
(4) Formation Fluid Pressure, psi	No formation fluid	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	500 to 1400	
(7) Age of Unit	Permian	
(8) Porosity %	low	
(9) Permeability, millidarcies	low	
(10) Reservoir Temperature, °C	21°	
(11) Character and Areal Distribution	Red and gray shales	

C. **Chemical Characteristics of Formation Fluids:** N/A

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. **Mineral Resources in Area:** There are no mineral resources reported in the area within 1.5 miles.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** The waste consists of fresh water and cement slurries viscosity - 1 to 70 poise, 15 pounds per gallon average.
2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: 1.2815×10^6 average.
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1 to 2.5
   - D. Temperature: 50 to 90°F
   - E. pH: 6.5 to 11

WIC OK-10

3. **Toxicity:** Slight - allergic reactions.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Cement is mixed with potable water from city mains.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	8-3/4	J-55 23#/ft.	7	357
Intermediate	6-1/4	J-55 11.6#/ft.	4-1/2	1234
Injection		J-55 6.4#/ft.	2-7/8	1219
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 7 inch casing - 120 sks. - Class A - 357 ft. to surface - 4-1/2 inch casing - 70 bbls Class H + CFR-2 - 1234 ft. to surface.

3. **Well Head Equipment (Name and Models):** Braden head type wellhead - O.C.T. type T-20 - 5-1/2 in. 3000 psi working.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Float Shoe 1234 ft. on 4-1/2" centralizers, Halliburton 4-1/2 S-3 12 total 1st @ float shoe and on each 3rd joint to surface.

5. **Bottom Hole Completion:** 4 - Hydra Jet Perforations @ 1224 ft. No open hole. Above opening (@1224 ft) is a cut-off slot approximately 1/2 in. wide.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** All injections are placed into hydraulic fractures - no stimulation programs.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Holding tanks (if used), flow lines, pumps, etc., are portable and are setup only when an injection is to be made.

2. **Filters:** N/A

WIC OK-10

3. **Pumps:** Two truck mounted T-10 pumps.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	2/71	Average	200	Maximum	400
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	10/72	Average	1000	Maximum	1100
"	3/72		1000		1500
"	6/71		750		2000
"	2/71		1000		1400

3. Annual Volume Injected, gal.
A. 1972 360,936 B. 1971 40,604 C. 1970 17,598

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: 1. Reschedule tests to postpone the need for the well. 2. A total retention lagoon is available for emergency usage.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Maximum injection pressure limit 3000 psi.

Well Id. Code: OK-11

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: DN
Operating Company Name and Address: Macklanburg - Duncan
P.O. Box 25188, Oklahoma City, Oklahoma

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 73
2. Latitude and Longitude: 35°32'04"/97°15'45"
3. Well Location (Legal Description): SE 1/4, SE 1/4, Sec 16, T12N, R3W
4. County: Oklahoma State: Oklahoma
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Neutralized anodizing chemicals and waste water.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OK-11

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l:
   - C. Specific Gravity:
   - D. Temperature:
   - E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC OK-11

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: OK-12

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: DN

Operating Company Name and Address: Kerr - McGee Corp., Cimarron Facility
Kerr - McGee Bldg., Oklamoma City, OK

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 73
2. Latitude and Longitude: 35°52'10"/97°35'00"
3. Well Location (Legal Description): NW 1/4, SW 1/4, Sec 12, T16N, R4W
4. County: Logan State: Oklahoma
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of nuclear fuel including: clarified effluent of lime treated HF scrubbers, cooling tower blowdown, boiler blowdown, domestic waste and water treatment brine.
2. Date Well Permitted: 10/1/68 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 2078 ft.
6. Name, Age, and Depth of Injection Zone: Wolfcamp, Permian
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OK-12

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Liquid process wastes containing ammonium nitrate, dissolved ammonia, nitric acid, and traces of uranium and plutonium.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC OK-12

3. **Toxicity:** Uranium highly toxic 0.5 - 1.0 mg/l recommended levels for drinking water; plutonium maximum permissible concentrations 0.04 - 0.00005 ug/ml

4. **Reactivity with Surface Equipment Components:** Corrossive to metal

5. **Degradability Level and Rate:** Decay of radioactive components

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal

7. **Pre-injection Waste Treatment:** Centrifuge, ion exchange, and filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Four holding ponds with a total capacity of 4,000,000 gallons

2. Filters: N/A

WIC OK-12

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 1__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: 6 monitor wells

B. Sampling Frequency and Water Quality Parameters Measured: Weekly

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and to be maintained in a manner that will prevent pollution of fresh water or endanger any natural resource.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as per USAEC license

Well Id. Code: OK-13

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDN Operational Status: DN
Operating Company Name and Address: Kerr - McGee Corp., Sequoya Facility
Oklahoma City, Oklahoma

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 35°31'12"/95°03'09"
3. Well Location (Legal Description): NE 1/4, Sec 21, T12N, R21E
4. County: Sequoya State: Oklahama
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of uranium hexafluoride - raffinate fluid, nitrates, ammonia, uranium, thorium and radium
2. Date Well Permitted: 10/96 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 3128 ft.
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician 2960 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Waste discharged into a nearby river.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Pennsylvanian	200	350	shale, limestone
	Mississippian	550	200	limestone
Hunton	Devonian	750	250	shale
Sylvan	Ordovician	1000	50	limestone
Viola	Ordovician	1050	40	sandstone, dolomite
Simpson	Ordovician	1090	1870	dolomite
Arbuckle	Ordovician	2960	150	limestone
		3110		granite

WIC OK-13

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	2960	
(3) Thickness (Ft.)	150	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas produced ne the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Clarified lime effluent, treated HF scrubber waste, cooling tower and boiler blowdown, radionuclides

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC OK-13

3. Toxicity: Toxic due to presence of metal in blowdown water and radionuclides.

4. Reactivity with Surface Equipment Components: Corrossion from scrubber waste and brine

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile.

7. Pre-injection Waste Treatment: lime treatment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two sludge pits, a clarifier lagoon, and an evaporation lagoon

2. Filters: N/A

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________
	________		________		________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________
	________		________		________

3. Annual Volume Injected, gal.

A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: OK-14

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: American Airlines Inc.
Tulsa, Oklahoma

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 36°13'05"/95°52'50"
3. Well Location (Legal Description): NW 1/4, SE 1/4, Sec. 13, T20N, R13E
4. County: Tulsa State: Oklahoma
5. SIC Classification: 4500

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Maintainance Shop and Hangar Wastes - solvents, oils, detergents, cleaners, etc.
2. Date Well Permitted: 9/5/59 Completed:
3. Injection Rate: 350,000 gpd
4. Injection Pressure: 600 psi
5. Total Depth of Well: 3060 ft.
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 1720 ft.
7. Date Injection Began: (Day) 27 (Month) 01 (Year) 60
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC OK-14

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	1729	
(3) Thickness (Ft.)	1307	
(4) Formation Fluid Pressure, psi	800	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Ordovician	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	29°	
(11) Character and Areal Distribution	limestone	

C. Chemical Characteristics of Formation Fluids: Saline: Chloride equal 76,000 ppm.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Solvents, oils and detergents.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC OK-14

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12		10-3/4	416
Intermediate		J-55 20#	7	1807
Injection			2-1/2	1807
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4" casing - 250 sk Portland + 500 # $CaCl_2$ - 7" casing - 450 sk Pozmix.

3. Well Head Equipment (Name and Models): Earlongher Engineering Inc. well head.

4. Packers, Centralizers, and Other Subsurface Equipment: Baker Model B pack-off, float shoe @ 1807 ft., baffle collar @ 1772 ft., metal petal basket @ 1319 & 1772 ft., centralizers @ 1287 & 1744 ft.

5. Bottom Hole Completion: Open hole completion 1807 - 3036 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: 1500 gal. 15% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 20,000 gal. tank. 15 ft. underground acts as a sump; 30,000 gal. skimmer tank removes oil and sludge (not completely adequate); 300,000 gal. equilizer basin with skimmer and scraper.

2. Filters: N/A

WIC OK-14

3. **Pumps:** Two triplex positive displacement pump (150 gpm at 600 psi) located 10 ft. below ground surface.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	9/29/72	Average	344	Maximum	450
"	1960		300		300
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	9/29/72	Average	350	Maximum	410
"	1/27/72		370		
"	9/10/72		372		
"	10/68		400		

3. Annual Volume Injected, gal.
A. 1972 153,633,406 B. 1971 98,809,800 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: 1000 psi pressure guage on well annulus observation well - one @ 180 ft. TD.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: By-pass to Bird Creek.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Required that an observation well be constructed through all fresh water zones.

C. Restrictions of Operation Procedures: Injection pressure limitations - 600 psi.

Well Id. Code: PA-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP

Operating Company Name and Address: Jones and Laughlin
3 Gateway Center - Pittsburgh, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 63
2. Latitude and Longitude: 40°36'32"/80°14'17"
3. Well Location (Legal Description): Borough Township
4. County: Beaver State: Pennsylvania
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste pickling acid.
2. Date Well Permitted: Completed: 9/12/60
3. Injection Rate: 144,000 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 5445 ft.
6. Name, Age, and Depth of Injection Zone: Oriskanv, Devonian
5388 ft.
7. Date Injection Began: (Day) 04 (Month) 10 (Year) 61
8. Total Volume Injected to Date: 143,744,000 (Gallons)
9. Date Injection Ceased: (Day) 08 (Month) 09 (Year) 72
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Quaternary	0	92	sand, gravel, clay
Alleghany Group	Pennsylvanian	92	183	limestone
Pottsville Group	Pennsylvanian	275	175	
Greenbrier Group	Mississippian	450	25	
Pocono Group	Mississippian	475	557	sandstone
Cussewago-Conneaut	Devonian	1032	3946	
Hamilton Group	Devonian	4978	247	limestone
Onondago Group	Devonian	5225	163	
Oriskany Group	Devonian	5388	37	sandstone
Helderberg Group	Devonian	5425	18	

WIC PA-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Oriskany	Hamilton
(2) Depth (Ft.)	5388	4978
(3) Thickness (Ft.)	37	247
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Devonian
(8) Porosity %	7.7	
(9) Permeability, millidarcies	35	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone widespread	limestone, shale widespread

C. Chemical Characteristics of Formation Fluids: Highly saline water: TDS = 253,900 ppm; chloride = 61,800 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: 2000 oil and gas wells in Beaver County.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 10% sulfuric acid and 10% iron sulfide

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive to metallic components due to presence of acids.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			20	73
Intermediate			13-3/8	211
			9-5/8	2406
Injection			7	5271
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - cement circulated to top; 9-5/8 inch casing - 600 sks; 7 inch casing - 460 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Fractured at 4300 psig

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Surface holding tanks with 2 day holding capacity.

2. Filters: Manifold filters.

WIC PA-1

3. **Pumps:** 1 set 4 diesel and 1 set 5 electric pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: PA-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP

Operating Company Name and Address: Hammermill Paper Co.
Erie, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°08'53"/80°03'10"
3. Well Location (Legal Description): N/A
4. County: Erie State: Pennsylvania
5. SIC Classification: 2611

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Pulp mill cooking liquor.
2. Date Well Permitted: 1/24/63 Completed:
3. Injection Rate: 600,000 gpd
4. Injection Pressure: 1100 psig
5. Total Depth of Well: 2270 ft.
6. Name, Age, and Depth of Injection Zone: Lockport, Silurian 2057 ft.
7. Date Injection Began: (Day) 24 (Month) 04 (Year) 64
8. Total Volume Injected to Date: 446,422,700 (Gallons)
9. Date Injection Ceased: (Day) 14 (Month) 04 (Year) 68
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Tully	Devonian	1128	88	limestone
Hamilton	Devonian	1216	130	shale
Onondago	Devonian	1346	265	limestone
Bass Isle	Silurian	1611	77	limestone
Salina	Silurian	1688	288	anhydrite
Greenfield	Silurian	1976	81	limestone
Lockport	Silurian	2057	245	dolomite

WIC PA-2

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit		Confining Bed
(1)	Name	Bass Isle	Lockport	Hamilton
(2)	Depth (Ft.)	1611	2057	1216
(3)	Thickness (Ft.)	81	245	130
(4)	Formation Fluid Pressure, psi	0.45 psi/ft est.		
(5)	Lithostatic Pressure, psi	1.0 psi/ft est.		
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft est.		
(7)	Age of Unit	Silurian		Devonian
(8)	Porosity %			
(9)	Permeability, millidarcies	230		
(10)	Reservoir Temperature, °C			
(11)	Character and Areal Distribution	limestone, dolo- mite extensive		shale extensive

C. Chemical Characteristics of Formation Fluids: Highly saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Spent sulfite pulping liquor containing fiber, fiber compounds, and paper filter materials.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 50,000
   C. Specific Gravity: 1.02
   D. Temperature: N/A
   E. pH: 5.3

WIC PA-2

3. Toxicity: High BOD

4. Reactivity with Surface Equipment Components: Slightly corrosive

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: High BOD indicates substantial substrate for bacterial activity.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		40# H-40	13-3/8	40
Intermediate		36# J-55	9-5/8	1359
			7	2106
Injection		Fibercast	5	1545
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 5 inch casing - 365 sks

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Cast iron bridge plug set in 7" casing at 1710 ft.

5. Bottom Hole Completion: Perforations from 1620 to 1670 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: 35,000 gal. 15% HCl at 1620 to 1670 ft. on 3/14/63

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Tanks for emergency

2. Filters: Microstrainers

WIC PA-2

3. Pumps: 2 reciprocating pumps, 194 gpm at 1590 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	9/66	Average	420	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	9/66	Average	1220	Maximum	1270
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Holding tanks.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: PA-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP
Operating Company Name and Address: Hammermill Paper Co.
Erie, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°03'33"/80°02'52"
3. Well Location (Legal Description): N/A
4. County: Erie State: Pennsylvania
5. SIC Classification: 2611

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Paper mill digesting liquors.
2. Date Well Permitted: Completed: 8/29/64
3. Injection Rate: 600,000 gpd
4. Injection Pressure: 1100 psig
5. Total Depth of Well: 5972 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 5914 ft.
7. Date Injection Began: (Day) (Month) 07 (Year) 65
8. Total Volume Injected to Date: 297,872,300 (Gallons)
9. Date Injection Ceased: (Day) (Month) 09 (Year) 68
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Salina	Silurian	1732	270	evaporites
Lockport Group	Silurian	2102	190	
Clinton Group	Silurian	2310	136	limestone
Alision Group	Silurian	2448	167	limestone
Cincinnatian	Ordovician	2615	1709	shale
Trenton	Ordovician	4324	196	limestone
Black River	Ordovician	4520	576	
Gatesburg	Cambrian	5096	422	dolomite
Franconia	Cambrian	5518	67	
Eau Claire	Cambrian	5586	328	dolomite
Mt. Simon	Cambrian	5914	38	sandstone
	PreCambrian	5952		metamorphics

WIC PA-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name	Bass Isle	Mt. Simon	Hamilton
(2) Depth (Ft.)	1658	5914	1215
(3) Thickness (Ft.)	74	38	130
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.		
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.		
(7) Age of Unit	Silurian	Cambrian	Devonian
(8) Porosity %			
(9) Permeability, millidarcies			
(10) Reservoir Temperature, °C			
(11) Character and Areal Distribution	dolomite widespread	sandstone	shale widespread

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Spent sulfite pulping liquor containing fiber, fiber fragments, paper filter materials such as clay and lignin compounds in colloidal and semi-colloidal range.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 50,000
   C. Specific Gravity: 1.02
   D. Temperature: N/A
   E. pH: 5.2

WIC PA-3

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Slightly corrosive

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Bacterial activity possible due to presence of organic substrate.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade		Size	Depth Set
Surface	17	54#	H-40	13-3/8	79
Intermediate	13	36#	J-55	9-5/8	2538
	9	26#	J-55	7	5100
Injection		15#	J-55	5	5972
Other					

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 85 sks 'A' Portland; 9-5/8 inch casing - 950 sks 'A' Portland; 7 inch casing - 480 sks 'A' Portland.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker model 'D' packer set at 1600 ft. between 7" and 5" casing.

5. Bottom Hole Completion: Perforated at 1620-1670 ft. w/271, 5.25 Selecto-jet; slotted: 5104-5200, 5360-5392,5520-5584, 5648-5680, 5776-5808, and 5904-5972

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized and fractured on 8/28/64 at 5100-5972 ft.; acidized on 8/29/64 at 1620-1710 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Six batch tanks, 4 - 100,000 gal. and 2 - 50,000 gal.; one surge tank.

2. Filters: Rotating leaf filters, trap filters prior to injection

WIC PA-3

3. Pumps: Reciprocating pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) 9/66 Average 420 Maximum 450
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) 9/66 Average 1350 Maximum 1520
"
"
"

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: PA-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP

Operating Company Name and Address: Gulf Research and Development Co.
Pittsburgh, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 07 (Year) 73
2. Latitude and Longitude: 40°32'47"/79°50'01"
3. Well Location (Legal Description): Colerain Township
4. County: Bedford State: Pennsylvania
5. SIC Classification: 2950

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Drilling mud (Bentonite) with quartz sand grains.
2. Date Well Permitted: Completed: 12/64
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 562 ft.
6. Name, Age, and Depth of Injection Zone: Bellefonte, Ordovician 540 ft.
7. Date Injection Began: (Day) (Month) 12 (Year) 64
8. Total Volume Injected to Date: 1,720,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) 10 (Year) 68
10. Previous Mode of Disposal: None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC PA-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Bellefonte	Bellefonte
(2) Depth (Ft.)	540	0
(3) Thickness (Ft.)	13	540
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	6000	
(7) Age of Unit	Ordovician	Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite	dolomite

C. Chemical Characteristics of Formation Fluids: Potable. TDS = 274 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Three abandoned wells covered by Pennsylvania Oil and Gas Division plugging permits: BED-41P, BED-44P, and BED-53P.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Bentonite drilling muds and waste water.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 300
   B. Conc. Dissolved Solids, mg/l: 500
   C. Specific Gravity: 1.00 - 1.08
   D. Temperature: ambient
   E. pH: 6.5 - 7.5

WIC PA-4

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** None

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			7	21
Intermediate			6-5/8	545
Injection			4-1/2	540
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 6-5/8 inch casing - 3 sks; 4-1/2 inch casing - 30 sks

3. **Well Head Equipment (Name and Models):** 4-1/2 inch casing head and master valve.

4. **Packers, Centralizers, and Other Subsurface Equipment:** None

5. **Bottom Hole Completion:** Open hole, 540 to 563 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 555 - 562 ft. water fractured with 8500 gal. at 420 gpm.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Earthen settling pits.

2. **Filters:** None

WIC PA-4

3. Pumps: Triplex plunger pumps.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Authorized by Pennsylvania State Department of Health Industrial Waste Permit #56411

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: PA-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** DN

Operating Company Name and Address: Bethlehem Steel Corporation
Johnstown, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 40°20'06"/78°53'26"
3. Well Location (Legal Description): N/A
4. County: Cambria State: Pennsylvania
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Weak ammonia liquor.
2. Date Well Permitted: 1/66 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 835 ft.
6. Name, Age, and Depth of Injection Zone: Burgoon, Mississippian
845 ft.
7. Date Injection Began: (Day) (Month) (Year) 66
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) 16 (Month) 04 (Year) 66
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC PA-5

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Burgoon	
(2) Depth (Ft.)	845	
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Mississippian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	

C. Chemical Characteristics of Formation Fluids: TDS = 104,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonia liquor containing phenol, hydrogen sulfide, and chloride.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: Total dose of 1.5 grams of phenol may be fatal to humans.

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			16	61
Intermediate			10-3/4	210
			7	570
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: 6-3/4 inch open hole from 579 to 845 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC PA-5

3. Pumps: ____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program
   - A. Monitoring Devices and Data: ____
   - B. Sampling Frequency and Water Quality Parameters Measured: ____
   - C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____
2. Contingency Plan for Well Failure During Operation: ____
3. Regulatory Aspects
   - A. Construction Requirements: ____
   - B. Monitoring Requirements: ____
   - C. Restrictions of Operation Procedures: ____

Well Id. Code: PA-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Koppers Company, Inc.
Petrolia, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 41°05'/79°40'
3. Well Location (Legal Description): Fairview Township
4. County: Butler State: Pennsylvania
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sodium sulfate - sulfite effluent containing minor amounts of phenolics.
2. Date Well Permitted: Completed: 8/12/69
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 3103 ft., plugged back to 2300 ft.
6. Name, Age, and Depth of Injection Zone: Speechly, Devonian 2152 ft.
7. Date Injection Began: (Day) 24 (Month) 09 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Van Port	Pennsylvanian	86	12	limestone
Shenago	Mississippian	602	71	sandstone
Riceville	Devonian	830	116	shale
Venago	Devonian	946	340	sandstone
Knox	Devonian	1206	34	sandstone
Apeechly	Devonian	2152	30	sandstone

WIC PA-6

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Speechly	
(2) Depth (Ft.)	2152	
(3) Thickness (Ft.)	80	
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone extensive	

C. Chemical Characteristics of Formation Fluids: Saline: TDS = 4322 ppm; pH = 7.7

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	28		sandstone	fresh
	126	80		sandstone, shale	fresh
	346	108		sandstone	brine

4. Mineral Resources in Area: Oil and gas.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Coal tar processing and coke manufacturing waste containing sodium sulfate and phenol.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC PA-6

3. Toxicity: Total dose of 1.5 grams of phenol may be fatal to humans.

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			13-5/8	42
Intermediate		33# H-40	10-3/4	435
			5-1/2	2275
Injection			2-3/8	1006
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 150 sks Pozmix; 5-1/2 inch casing - 650 sks Pozmix.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Otic packer at 1006 ft

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Fractured - 3175 psi, 1942 gal water + 6500# sand at 1907 ft: 3900 psi, 1700 gal water + 5000# sand @ 2160'

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two 40,000 gallon holding tanks.

2. Filters: Duel sand filters.

WIC PA-6

3. **Pumps:** Duel Triplex plunger pumps w/3 fluid end constructed of corrosion resistant metal.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: PA-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN

Operating Company Name and Address: Peoples Natural Gas Co., Rager Mountain Fac.
Pittsburg, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 73
2. Latitude and Longitude: 78°55'/40°25'
3. Well Location (Legal Description): N/A
4. County: Cambria State: Pennsylvania
5. SIC Classification: 1382

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Mining waste containing $FeSO_4$ and H_2SO_4
2. Date Well Permitted: Completed: 12/22/70
3. Injection Rate: 30 gpm
4. Injection Pressure: 570 psi
5. Total Depth of Well: 1090 ft.
6. Name, Age, and Depth of Injection Zone: Murrysville, Pennsylvanian 919 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
		0	10	clay
		10	80	sand
		90	115	red rock
		205	202	sand
		407	2	coal
		409	248	sand
		637	35	slate, lime
		672	182	sand
		854	76	slate
Murrysville	Pennsylvanian	930	45	sand
		975	115	slate

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Murrysville	Unnamed
(2) Depth (Ft.)	919	841
(3) Thickness (Ft.)	62	78
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Pennsylvanian	Pennsylvanian
(8) Porosity %	14.0	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	shale

C. Chemical Characteristics of Formation Fluids: pH - 8.0; Cl⁻ - 3118 ppm Fe - 1 ppm; SO_4 - 8 ppm; Ca - 47 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Coal

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Fe - 10 ppm; Cl⁻ - 11,911 ppm Ca - 1196 qpm; Mg - 217 ppm; Na - 5942 ppm

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 19,566
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 6.8

WIC PA-7

3. **Toxicity:** None

4. **Reactivity with Surface Equipment Components:** Possibly corrossive

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal

7. **Pre-injection Waste Treatment:** Settling tank

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	10-1/2	Steel	9-5/8	16
Intermediate				
Injection	8-1/2	20#	6-5/8	919
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Portland

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Open hole 919 - 1090 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 919-1090' 10,000 gal & 11,500# 17 bb; 1508' fractured @1600 psi; 1482' fractured @3000 psi

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 1,500,000 gal. holding pond

2. **Filters:** N/A

WIC PA-7

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: PA-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NOUP

Operating Company Name and Address: Hammermill Paper Company
Erie, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°08'26"/80°02'59"
3. Well Location (Legal Description): N/A
4. County: Erie State: Pennsylvania
5. SIC Classification: 2611

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Pulp mill liquor
2. Date Well Permitted: Completed: 5/15/68
3. Injection Rate: 600,000 gpd
4. Injection Pressure: 1600 psi
5. Total Depth of Well: 2354 ft.
6. Name, Age, and Depth of Injection Zone: Bass Island, Silurian 1586 ft.
7. Date Injection Began: (Day) (Month) 05 (Year) 68
8. Total Volume Injected to Date: 353,670,700 (Gallons)
9. Date Injection Ceased: (Day) (Month) 06 (Year) 70
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Onondago	Devonian	1385	201	limestone
Bass Island	Silurian	1586	151	limestone, dolomite
Salina	Silurian	1737	365	evaporites
Lockport	Silurian	2102	218	dolomite
Clinton	Silurian	2320	34	sandstone

WIC PA-8

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Bass Island	Hamilton
(2) Depth (Ft.)	1586	1215
(3) Thickness (Ft.)	151	130
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Silurian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite widespread	shale widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Pulp mill liquor containing fiber, fiber compounds, and paper filter material.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 50,000
   C. Specific Gravity: 1.02
   D. Temperature: ambient
   E. pH: 5.3

3. **Toxicity:** High BOD.

4. **Reactivity with Surface Equipment Components:** Slightly corrosive.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Bacterial activity possible due to presence of organic substrate.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			13-3/8	58
Intermediate			9-5/8	1393
			7	2179
Injection		Fiberglass	5	1601
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 100 sks.; 9-5/8 inch casing - 300 sks.; 7 inch casing - 435 sks; 5 inch casing - 150 sks

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: 15,000 gal. HCl at 2150 psi

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC PA-8

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: ______

Well Id. Code: PA-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN

Operating Company Name and Address: Bethlehem Mines Corp.
Ellsworth, Pennsylvania

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 12 (Month) 08 (Year) 65
2. Latitude and Longitude: 40°00'00"/80°05'00"
3. Well Location (Legal Description): N/A
4. County: Washington State: Pennsylvania
5. SIC Classification: 3311

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: Completed: 2/22/68
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 1588 ft.
6. Name, Age, and Depth of Injection Zone: Salt Sands, Pennsylvanian
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC PA-9

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Salt Sands	
(2) Depth (Ft.)	1431	
(3) Thickness (Ft.)	86	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pennsylvanian	
(8) Porosity %	4.5 - 10	
(9) Permeability, millidarcies	0 - 122	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC PA-9

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Conductor	20	23
Intermediate		H-40	10	530
Injection		J-55	7	1302
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): Well capped w/2" dia vent line set approx. 10' above top of casing.

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: 1800 psi fracture (11/18/65), 1800 psi fracture (2/17/66)

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC PA-9

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TN-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NOUP
Operating Company Name and Address: E.I. DuPont de Nemours Company, Inc.
P.O. Box 629 - New Johnsville, Tennessee

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 36°02'57"/86°59'05"
3. Well Location (Legal Description): Sec 14, T6S, R19E
4. County: Humphreys State: Tennessee
5. SIC Classification: 2816

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from the production of paint pigment.
2. Date Well Permitted: 2/20/67 Completed:
3. Injection Rate: 280 gpm
4. Injection Pressure: 200 psig
5. Total Depth of Well: 6735 ft.
6. Name, Age, and Depth of Injection Zone: Knox, Cambrian 3000 ft.
7. Date Injection Began: (Day) (Month) 03 (Year) 67
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) 01 (Year) 72
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Quaternary	0	240	sand, gravel, clay
	Silurian	240	240	limestone
	Ordovician	480	3100	limestone, shale
Knox	Cambrian	3580		dolomite, shale

WIC TN-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Knox	
(2) Depth (Ft.)	3000	1400
(3) Thickness (Ft.)	3734	1600
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	Ordovician-Cambrian
(8) Porosity %	5 - 30	
(9) Permeability, millidarcies	110	
(10) Reservoir Temperature, °C	22°	
(11) Character and Areal Distribution	dolomite	carbonates, shale

C. Chemical Characteristics of Formation Fluids: Saline water under artesian conditions

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Fort Payne		200	extensive	limestone	saline

4. Mineral Resources in Area: No mineral resources in the area of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Aqueous wastes from the manufacturing operation to produce paint pigment. 13-15% aqueous solution of ferric chloride.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.1 - 1.12
   - D. Temperature: N/A
   - E. pH: 1.5 - 1.6

WIC TN-1

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive to metallic components.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Sedimentation.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13		10-3/4	600
Intermediate	9-5/8	Steel	7	1600
Injection		Chemtube	4-1/2	1800
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Pozmix to the surface.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer on 4-1/2 inch casing.

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 15,000 gal. of HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TN-1

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous rate and pressure recorders; well pressure checked periodically.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Constructed, maintained and equipped in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Monitor local water supply well and report quarterly.

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: TN-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: E.I. DuPont de Nemours Company, Inc.
P.O. Box 629 - New Johnsville, Tennessee

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 36°02'57"/86°59'05"
3. Well Location (Legal Description): SW 1/4, SE 1/4, NW 1/4, Sec 14, T6S, R19E.
4. County: Humphreys State: Tennessee
5. SIC Classification: 2816

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from the production of paint pigment.
2. Date Well Permitted: 2/70 Completed:
3. Injection Rate: 450 gpm
4. Injection Pressure: 500 psi
5. Total Depth of Well: 7461 ft.
6. Name, Age, and Depth of Injection Zone: Knox, Cambrian
4100 ft.
7. Date Injection Began: (Day) (Month) 04 (Year) 70
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TN-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Knox	
(2) Depth (Ft.)	4100	1400
(3) Thickness (Ft.)	3361	2700
(4) Formation Fluid Pressure, psi	2050 - 3000	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	Ordovician-Cambrian
(8) Porosity %	10 at 4410 ft.	
(9) Permeability, millidarcies	110	
(10) Reservoir Temperature, °C	25°	
(11) Character and Areal Distribution	dolomite widespread	carbonates, shale widespread

C. Chemical Characteristics of Formation Fluids: Highly saline : chlorides- 73,950 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Fort Payne		200		limestone	saline

4. Mineral Resources in Area: No mineral resources in the area of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 13 - 15% aqueous solution of ferric chloride.

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: N/A
B. Conc. Dissolved Solids, mg/l: N/A
C. Specific Gravity: 1.1
D. Temperature: N/A
E. pH: 1.5

WIC TN-2

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Corrosive to metallic components

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	30	J-55	24	72
Intermediate	20	J-55	16	445
	20	J-55	13-3/8	606
Injection	13-3/4	Fibercast	9-5/8	4650
Other	12	J-55	9-5/8	4100

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 9-5/8 inch casing - bottom 2000 ft. cemented; 9-5/8 inch casing (injection) - latex cement; all other casing cemented to surface with Portland cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Centralizers - 16" and 13-3/8" casing - 2 on bottom 4 joints and 1 on every joint above; 1 on bottom of Fibercast and 1 every 4 joints to surface.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with 15,000 gal. HCl at 1000 psi.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TN-2

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous pressure recorders; pressure checked periodically.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Constructed, equipped, and maintained so as to prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Total disolved solids not to exceed 10,000 ppm.

Well Id. Code: TN-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Stauffer Chemical Co., Agricultrual Chemical Div., Mount Pleasant, Tennessee

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 35°31'20"/87°14'10"
3. Well Location (Legal Description): Sec 16, T12S, R28E
4. County: Maury State: Tennessee
5. SIC Classification: 2819

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical brines.
2. Date Well Permitted: 2/10/69 Completed:
3. Injection Rate: 25 gpm
4. Injection Pressure: gravity
5. Total Depth of Well: 6473 ft.
6. Name, Age, and Depth of Injection Zone: Knox, Cambrian 3150 ft.
7. Date Injection Began: (Day) 10 (Month) 03 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TN-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Knox	
(2) Depth (Ft.)	3150	
(3) Thickness (Ft.)	2500	
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite widespread	

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: No mineral resources reported in the vicinity of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Carbonate brine solution containing sodium chloride, sodium bicarbonate, sodium carbonate, and paranitrophenol.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.08
   D. Temperature: N/A
   E. pH: N/A

WIC TN-3

3. **Toxicity:** Paranitrophenol may be harmful to fish.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components by brine solution.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Settled and decanted in a 250,000 gal. tank.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-3/4		16	15
Intermediate	13-3/4		10-3/4	1010
	8-3/4		7	2956
Injection		Tubing	2-7/8	2986
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16 inch casing - 300 sks Portland

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer on 2-7/8 inch casing.

5. **Bottom Hole Completion:** Open hole from 2986 to 6473 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with 15,000 gal. 20° Be' HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 250,000 gal settling tank.

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Pres-nt)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: One monitor well, 3500 ft. north; continuous rate and pressure recorders.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Constructed, equipped, and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Continuous pressure - rate recorders used.

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: TN-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: DAP **Operational Status:** DN
Operating Company Name and Address: E.I. DuPont de Nemours Co.
New Johnsville, Tennessee

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 36°02'57"/86°59'05"
3. Well Location (Legal Description): N/A
4. County: Humphreys State: Tennessee
5. SIC Classification: 2816

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 7641 ft.
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TN-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: ______________________________

   B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

   A. Construction Requirements: ______________________________

   B. Monitoring Requirements: ______________________________

   C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: TX-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Monsanto Chemical Company
P.O. Box 711 - Alvin, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 13 (Month) 08 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Perry and Austin League 2, Ab 107
4. County: Brazoria State: Texas
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical wastes from the manufacture of cumene phenol.
2. Date Well Permitted: 11/14/61 Completed:
3. Injection Rate: 221,500 gpd
4. Injection Pressure: 400 psi
5. Total Depth of Well: 6409 ft, plugged back to 6320 ft.
6. Name, Age, and Depth of Injection Zone: Miocene Sands, Miocene
7. Date Injection Began: (Day) (Month) 08 (Year) 70
8. Total Volume Injected to Date: 80,847,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Two detention lagoons

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene			clay, sand
Lissie	Pleistocene			clay, gravel
Goliad	Pliocene			sand, gravel, clay
Lagarto	Pliocene			clay, sand
Oakville	Miocene			sand
Catahoula	Miocene			tuff, bentonite, sand

WIC TX-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		Goliad-Oakville
(2) Depth (Ft.)	6000	1000
(3) Thickness (Ft.)		5000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Pliocene-Miocene
(8) Porosity %	30	
(9) Permeability, millidarcies	150 - 2400	
(10) Reservoir Temperature, °C	49°	
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: TDS = 94,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay	fresh
Lissie		1000	extensive	sand, gravel	fresh

4. Mineral Resources in Area: Oil in the immediate area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: There are several abandoned oil wells in the immediate area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Wastes from Cumene phenol manufacture including organics and inorganic salts.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 49
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: 7.5

WIC TX-1

3. **Toxicity:** Phenol highly toxic.
4. **Reactivity with Surface Equipment Components:** Slightly corrosive.
5. **Degradability Level and Rate:** Phenol may degrade anaerobically .
6. **Biological Level at Injection and Estimated Biological Level After Injection:** bacterial activity unlikely due to presence of phenol.
7. **Pre-injection Waste Treatment:** Sedimentation, skimming, pH adjustment, and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	16			20
Intermediate		40# H-40	10-3/4	2011
		26# J-55	7	3541
Injection		11.34# N-80	4	3541
Other		4.7# J-55	2-3/8	6174.84

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 860 sks cement; 7 inch casing - 1600 sks Pozmix + 4% gel.
3. **Well Head Equipment (Name and Models):** Cameron Iron Works, Inc. Design. 10-3/4" Thd 8rd x 10" series 600 flange CIW 10" x 6" series 600 CIW LD head 2" series 600 upper section w/ 3 - 2" valves, 2" tee, 2" choke body, 6"x2" flange
4. **Packers, Centralizers, and Other Subsurface Equipment:** 3 gas valve lifts at 841.20 ft, 1256 ft, and 1661.90 ft.; Baker model D packer at 3541.66 ft.; TIW L.H. packer at 3531.66 ft.
5. **Bottom Hole Completion:** 30'-4" stainless screen undereamed and gravel packed 6160 to 6365 ft.: Bullet perforations, 8/ft. at 6045 to 6294 ft.
6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 50,000 gal. sludge tank, pH mixing tank, and 300,000 gal. surge tank.
2. **Filters:** 3 pressure sand filters.

WIC TX-1

3. **Pumps:** Centrifugal - 400 gpm at 1500 psig

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	7/70	Average	77	Maximum	225
"	1/71		198		259
"	7/71		246		369
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	7/70	Average	410	Maximum	880
"	1/70		234		370
"	7/71		860		1060
"					

3. Annual Volume Injected, gal.
A. 1971 54,037,000 B. 1970 26,810,000 C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. **Monitoring Devices and Data:** Well head and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** 600,000 gal. storage tank.

3. Regulatory Aspects

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure and total volume; report biannually

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: TX-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC **Operational Status:** PC

Operating Company Name and Address: Monsanto Company
P.O. Box 1311, Texas City, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 07 (Month) 09 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Located 8290 ft. west of the east line and 4093 ft. north of the south line on the Monsanto Chocolate Bayou site
4. County: Brazoria State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: 11/14/61 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TX-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

WIC TX-2

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC ______TX-2______

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Potash Company of America
P.O. Box 1178 - Dumas, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 14 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 35°56'11"/101°57'11"
3. **Well Location (Legal Description):** Section 362, Block 44, H.&T.C.R.R. Co. Survey, 850 ft. FEL and 1050 ft. FSL.
4. **County:** Moore **State:** Texas
5. **SIC Classification:** 1474

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Excess 20° Baume hydrochloric acid produced by sulfate conversion.
2. **Date Well Permitted:** 12/61 **Completed:**
3. **Injection Rate:** 2,100,000 gpy
4. **Injection Pressure:** gravity
5. **Total Depth of Well:** 1265 ft.
6. **Name, Age, and Depth of Injection Zone:** Glorietta, Permian 1250 ft.
7. **Date Injection Began: (Day)** **(Month)** 11 **(Year)** 64
8. **Total Volume Injected to Date:** 15,483,559 **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Surface pits.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	210	sand, clay
Ogallala	Tertiary	210	255	sand, caliche
Red Beds	Permian	465	645	shale, gypsum
Glorietta	Permian	1110	555	limestone, dolomite, sand

WIC TX-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Glorietta	Red Beds
(2) Depth (Ft.)	1250	465
(3) Thickness (Ft.)	155	645
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	Permian
(8) Porosity %	20	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, dolomite	shale, gypsum

C. Chemical Characteristics of Formation Fluids: High chloride ion concentration

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	210	255		sand	potable
Red Beds	465	645		shale, gypsum	brackish

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 17 water wells within 4 mile radius, depth range from 310 to 515 ft.; Shamrock Oil and Gas Corporation has two wells 2 miles east and one well 5 miles east of the disposal well.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 31.45% hydrochloric acid solution.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.16
   D. Temperature: N/A
   E. pH: N/A

WIC TX-3

3. **Toxicity:** Exceedingly corrosive to tissue; concentrated hydrochloric acid with accompanying irritating vapors of chlorine gas.

4. **Reactivity with Surface Equipment Components:** Exceedling corrosive to all metals.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** No bacterial activity likely.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	11	24# J-55	8-5/8	1088
Intermediate	7-7/8	Fibercast	3-1/2	1150
	7-7/8	Fibercast screen	3-1/2	1150-1250
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 900 cu. ft. of Pozmix #1 with 2% $CaCl_2$ in 750 of the sacks.

3. **Well Head Equipment (Name and Models):** A Nominal 3 inch fibercast well head with a 50 psi, Falls Industry rupture disk and a 2 inch Nominal polyethylene inset pipe.

4. **Packers, Centralizers, and Other Subsurface Equipment:** 264.6 gallons of acid resistant Hydromite pumped between 8-5/8" and 3-1/2" casing to form plug (set at 1013 ft.). Two centralizers use.

5. **Bottom Hole Completion:** Fibercast screen was gravel packed from 1135 - 1265 feet with 45 cu. ft. of 8-1/2 mesh frac sand.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) 12/64-12/71	Average 40	Maximum 50
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) 12/64-12/71	Average vacuum	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19 71 2,462,684 B. 19 70 2,074,981 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Biannual report with monthly data of injection pressure, rate, and total volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically monitored.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Surface pits.

3. Regulatory Aspects

A. Construction Requirements: Shall not be constructed to a depth less than 1250 ft. below the surface of the ground and as specified by the Texas Water Commission No. WDW-13.

B. Monitoring Requirements: Casing pressure tests; bottom hole pressure tests; somplete chemical analysis of waste water; monitor annulus and well head pressure and rates; report biannually.

C. Restrictions of Operation Procedures: Permit allows 157,000 gal. per month or maximum of 1,900,000 gal. per year. Well head pressure no to exceed 250 psi .

Well Id. Code: TX-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: E.I. DuPont de Nemours, Victoria Plant
P.O. Box 2626 - Victoria, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 17 (Month) 08 (Year) 72
2. Latitude and Longitude: 28°39'30"/96°56'15"
3. Well Location (Legal Description): Desideria Garcia League, Ab. A-38, 4250 ft. from the northwest line and 18,650 ft. from the northeast line.
4. County: Victoria State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Salt water with minor amounts of copper and cyanide.
2. Date Well Permitted: 2/63 Completed:
3. Injection Rate: N/A
4. Injection Pressure: 170 psi
5. Total Depth of Well: 4800 ft.
6. Name, Age, and Depth of Injection Zone: Lower Catahoula, Miocene 3960-4636 ft.
7. Date Injection Began: (Day) 27 (Month) 12 (Year) 63
8. Total Volume Injected to Date: 588,515,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Disposal into the Guadalupe River.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0		sand, clay, gravel
Beaumont	Pleistocene		1600	clay
Lissie	Pleistocene			sand, gravel
Goliad	Pliocene			sand
Lagarto	Miocene			clay
Oakville	Miocene	3000	700	sand
Catahoula	Miocene	3700	700	sand
Greta	Miocene	4400	300	sand

WIC TX-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining bed
(1) Name	Catahoula	Goliad-Oakville
(2) Depth (Ft.)	3960	1600
(3) Thickness (Ft.)	676	2100
(4) Formation Fluid Pressure, psi	2001	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Pliocene-Miocene
(8) Porosity %	28	
(9) Permeability, millidarcies	300	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	sand, clay

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium			variable	sand, gravel	fresh
Beaumont			extensive	clay	fresh
Lissie			extensive	sand, gravel	fresh

4. Mineral Resources in Area: Oil and natural gas.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Three water supply wells, two abandoned oil wells, and three other disposal wells on DuPont property.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Brine with minor amounts of copper, cyanide, ammonia, chlorides and organics.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.12 - 1.14
   D. Temperature: N/A
   E. pH: 7.5 - 8.5

WIC TX-4

3. **Toxicity:** Cyanide highly toxic.

4. **Reactivity with Surface Equipment Components:** Little corrosion due to lining of lines and basins with rubber.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Very little bacterial activity likely due to presence of cyanide.

7. **Pre-injection Waste Treatment:** Waste cooled by heat exchange, aqueous NaOH added to neutralize, run into baffled settling basin, solids removed, then polished in a perculator packed filter.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	J-55	10-3/4	2011
Intermediate		J-55	7	4800
Injection		4.7# J-55 EUE	2	4700
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 1000 sks + 4% gel.: 7 inch casing - 515 sks Portland + 4% gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforated 3960 - 4636 ft. with crackjet charges.

6. Hydraulic Fracturing, Acidizing Programs, etc.: 4000 gal. Halliburton 15% inhibited HCl at least once yearly.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-4

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
6/64	110	205
6/66	175	235
6/70	115	225
6/72	115	225

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
6/64	170	270
6/66	105	180
6/70	170	345
6/72	175	350

3. Annual Volume Injected, gal.
A. 1972 43,866,000 B. 1971 100,707,000 C. 1970 72,094,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rates and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing should hold within a 5% variation for one hour pressure test at 1500 psi. This test is performed annually.

B. Monitoring Requirements: Report any significant changes in operation immediately and report bimonthly.

C. Restrictions of Operation Procedures: Not ot exceed 1000 psi injection pump pressure at a rate not greater than 310 gpm.

Well Id. Code: TX-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Northern Natural Gas Company
Star Route #1, Box 27A - Spearman, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 14 (Month) 08 (Year) 72
2. Latitude and Longitude: 36°04'30"/101°04/54"
3. Well Location (Legal Description): Section 23, Block R, B&B Survey, 400 ft. FEL and 350 ft. FSL.
4. County: Ochiltree State: Texas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Industrial waste from natural gas compressor and purifier plant.
2. Date Well Permitted: 4/3/63 Completed:
3. Injection Rate: 3,600,000 gpy
4. Injection Pressure: gravity
5. Total Depth of Well: 4050 ft.
6. Name, Age, and Depth of Injection Zone: Hollenburg, Permian 3500 - 3850 ft.
7. Date Injection Began: (Day) (Month) 01 (Year) 64
8. Total Volume Injected to Date: 30,588,240 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Disposal to surface pit located on plant property.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	950	sand, gravel, clay
Ogallala	Pliocene		710	sandstone
Cimarron	Permian	2330	320	evaporites
Red Beds	Permian	2650	530	shale
Wichita	Permian	3180	104	shale, evaporites
Hollenburg	Permian	3284	536	dolomite
Wolfcamp	Permian	3820	680	dolomite
	Permian	4500		limestone, anhydrite

WIC TX-5

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Hollenburg	Cimarron-Wichita
(2) Depth (Ft.)	3284	2330
(3) Thickness (Ft.)	536	950
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.03 psi/ft est.	
(7) Age of Unit	Permian	Permian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite	shale, evaporites

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	0			sand, gravel	fresh
Ogallala			extensive	sandstone	fresh

4. Mineral Resources in Area: Gas field

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Three shallow water supply wells and 14 gas wells within 2-1/2 miles.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Hydrocarbons, iron, chromate, chloride, and sulfate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l: 19,943
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 5.7

3. **Toxicity:** May be slightly toxic due to presence of acid conditions.

4. **Reactivity with Surface Equipment Components:** Mildly corrosive on metallic fixtures.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Separator and settling basin with oil sump.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32# H-40, R-2 Youngstown	8-5/8	986
Intermediate		15.5# J-55 Youngstown	5-1/2	4047
Injection		6/5# J-55 Youngstown	2-7/8	3688
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 700 sks 50-50 Pozmix with 1/4# Flocel per sack and 2% $CaCl_2$; 5-1/2 inch casing - 250 sks Encor, 50% Pozmix with 12-1/2# Gilsonite

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 3 centralizers on 8-5/8 inch casing and 9 on the 5-1/2 inch casing; Baker model "D" packer on wire line at 3518 ft.

5. **Bottom Hole Completion:** Perforated with 2 jets per ft at 7 intervals between 3623 and 4016 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Fractured at 2100 psi and 1400 psi; acidized with 300 gal 15% RIA acid at 1150 psi.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Storage and surge tank with 1000 barrel capacity.

2. **Filters:** None

WIC TX-5

3. **Pumps:** Layne centrifugal 14 stage with 8 inch bowels.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/64	Average	13.8	Maximum	190
"	6/66		6.6		190
"	6/69		1.2		80
"	6/72		18.5		80

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/64-6/72	Average	18" Hg vacuum	Maximum	24" Hg vacuum
"					
"					
"					

3. Annual Volume Injected, gal.
A. 1972 2,443,590 B. 1971 5,669,560 C. 1970 1,618,022

VIII. SAFETY INFORMATION

1. Monitoring Program

A. **Monitoring Devices and Data:** Continuous pressure readings at well head of annulus.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically monitored.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Surface pits.

3. **Regulatory Aspects**

A. **Construction Requirements:** Test pressure at 1000 psi for casing leakage.

B. **Monitoring Requirements:** Casing and bottom hole pressure test; complete chemical analysis of waste; monitor rates and volume of flow; report biannually.

C. **Restrictions of Operation Procedures:** Not to exceed well head pressure of 1000 psi.

Well Id. Code: TX-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDC **Operational Status:** NOUP
Operating Company Name and Address: Pan American Petroleum Corporation
P.O. Box 660 - Tyler, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 73
2. Latitude and Longitude: 32°57'18"/95°52'33"
3. Well Location (Legal Description): 5175 ft. FEL and 1425 FNL of the Oscar Engledow Survey, Ab. - 181.
4. County: Wood State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Cooling tower blowdown water, gas field produced salt water, and other minor wastes from a gasoline plant.
2. Date Well Permitted: 4/3/63 Completed:
3. Injection Rate: N/A
4. Injection Pressure: 400 psi
5. Total Depth of Well: 5231 ft.
6. Name, Age, and Depth of Injection Zone: Woodbine, Cretaceous 4775 - 5160 ft.
7. Date Injection Began: (Day) (Month) 05 (Year) 63
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) 01 (Month) 08 (Year) 72
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TX-6

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Woodbine	
(2) Depth (Ft.)	4775	350
(3) Thickness (Ft.)	385	4350
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cretaceous	Tertiary-Cretaceous
(8) Porosity %		
(9) Permeability, millidarcies	400	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	sand, clay

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	0	350	extensive	sand	potable

4. Mineral Resources in Area: Oil and gas occur in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: All wells are stated to be sufficiently plugged.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling tower blowdown and boiler blowdown water - fresh water with dissolved minerals at 5 times their original concentration plus chromates and phosphates.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 8000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-6

3. **Toxicity:** Blowdown water plus chromates may be toxic; chromate limited to 0.05 mg/l in drinking water.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** None

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15		10-3/4	460
Intermediate			7	5231
Injection		Plastic tubing	4-1/2	4716
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - cemented to top; 7 inch casing - 970 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer set at 4700 feet.

5. **Bottom Hole Completion:** Perforations at 4940 to 5090 feet.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 300 gal. Fe acid at 500# pressure (6/30/69), 500 gal. 20% Fe acid (6/18/69), 3000 gal. 25% Fe acid (8/9/68)

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TX-6

3. **Pumps:** Fairbanks, rated maximum of 350 gpm.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
7/66	110	180
7/67	155	200
7/68	100	165
7/69	155	200

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
7/66	200	250
7/67	375	375
7/68	300	400
7/69	400	400

3. Annual Volume Injected, gal.
A. 1969 10,237,685 B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum operating surface pressure of 1250 psi and a volume not greater than 10,000 barrels per day.

Well Id. Code: TX-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Western Ammonia Corporation
P.O. Box 1008 - Dimmitt, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 16 (Month) 08 (Year) 72
2. Latitude and Longitude: 34°31'45"/102°17'18"
3. Well Location (Legal Description): Castro County, Block M-10-A, Section 22.
4. County: Castro State: Texas
5. SIC Classification: 2819

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Cooling tower and boilter blowdown water.
2. Date Well Permitted: 10/64 Completed:
3. Injection Rate: 149,683,300 gpy
4. Injection Pressure: 390 psi
5. Total Depth of Well: 4600 ft.
6. Name, Age, and Depth of Injection Zone: Santa Rosa, Triassic 951 - 980 ft.
7. Date Injection Began: (Day) 03 (Month) 05 (Year) 65
8. Total Volume Injected to Date: 274,296,530 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Disposal into an unlined pit.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Ogallala	Pliocene	0	393	clay, sand, gravel
Dockum Group	Triassic	393	307	shale
Chinle	Triassic	700	250	sandstone
Santa Rosa	Triassic	950	30	sandstone

WIC TX-7

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Santa Rosa	
(2) Depth (Ft.)	950	540
(3) Thickness (Ft.)	30	400
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Triassic	Triassic
(8) Porosity %	10 - 30	
(9) Permeability, millidarcies	300	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone widespread .	shale, sandstone widespread

C. Chemical Characteristics of Formation Fluids: TDS = 25,400 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	0	393	extensive	sand, gravel	fresh
Chinle			extensive	sandstone	usable

4. Mineral Resources in Area: Extensive oil production in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Two oil tests: 2-1/2 miles southeast with wooden plugs set at 3100, 2430, and 150 ft.: 4 miles southwest, temporarily abandoned hole with all casing left in.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling tower blowdown and water treating plant wastes containing chloride, chromate, sulfide and nitrate.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 1440
   B. Conc. Dissolved Solids, mg/l: 2300
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 3.0

WIC TX-7

3. **Toxicity:** Chromate may be toxic to humans.

4. **Reactivity with Surface Equipment Components:** Possibly corrosive to steel components.

5. **Degradability Level and Rate:** Possible chromate reduction by heat.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Concrete block API separator.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	18	30.33#	14	417
Intermediate	12-1/2	36# J-55	9-5/8	1042
Injection		2.1# Fiberglass tubing	3	930
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 14 inch casing - 310 sks Pozmix plus 2% $CaCl_2$ and 4% gel. + 100 sks Pozmix plus 2% $CaCl_2$; 9-5/8 inch casing - 300 sks Pozmix + 200 sks Neat cement w/ 1/4# Flocele per sack.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker tension packer; 55 gallons of Dowell "Carban" corrosion inhibitor in annulus.

5. Bottom Hole Completion: Perforated with 4 holes per foot, 951 - 980 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: 1,000 gallons of acid mud.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two earthen pits.

2. Filters: N/A

WIC TX-7

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12/65	Average		Maximum	50
"	12/67		35		90
"	12/69		139		139
"	12/71		128		128

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12/65	Average	350	Maximum	375
"	12/67		150		175
"	12/69		180		390
"	12/71		390		390

3. Annual Volume Injected, gal.
A. 1971 41,275,000 B. 1970 66,060,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Automatic shut-off valve set at 400 psi.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Well head pressure not to exceed 400 psi.

Well Id. Code: TX-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Celanese Chemical Company
P.O. Box 509 - Bay City, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 14 (Month) 08 (Year) 72
2. Latitude and Longitude: 28°52'01"/96°01'02"
3. Well Location (Legal Description): James Moore League, Abs. No. 62
4. County: Matagorda State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Natural gas production, cooling tower and boiler waste.
2. Date Well Permitted: 6/26/64 Completed:
3. Injection Rate: 163,000,000 gpy
4. Injection Pressure: 415 psi
5. Total Depth of Well: 3728.96 ft.
6. Name, Age, and Depth of Injection Zone: Miocene sands, 3400 - 3600 ft.
7. Date Injection Began: (Day) (Month) 08 (Year) 64
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Holding ponds and a large rice field

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TX-8

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Miocene	
(2)	Depth (Ft.)	3400	1300
(3)	Thickness (Ft.)	300	2000
(4)	Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5)	Lithostatic Pressure, psi	1.0 psi/ft est.	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7)	Age of Unit	Miocene	Pliocene-Miocene
(8)	Porosity %	27.2 - 35.7	
(9)	Permeability, millidarcies	193 - 1389	
(10)	Reservoir Temperature, °C	63° at 3491 ft.	
(11)	Character and Areal Distribution	sand	shale, clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay, sand	fresh
Lissie		1300	extensive	sand	fresh to saline

4. Mineral Resources in Area: Oil and gas production.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 29 shallow wells (135-150 ft.) within 3 miles; 26 dry and abandoned holes; 33 oil tests have been made; 4 abandoned producers; 3 currently producing wells - depths range from 8000 to 11,000 ft.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling tower and boiler water with organics, nitrate, vanadium , copper and ash.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 50
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: 3.0

3. **Toxicity:** High vanadium content and presence of chlorinated hydrocarbons may produce some toxicity to humans.

4. **Reactivity with Surface Equipment Components:** Corrosive to metallic components.

5. **Degradability Level and Rate:** Organic fraction is oxidizable.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Process run-off sump, settler-skimmer, caustic acid neutralization, coarse filtration, polishing filters.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			15	1534
Intermediate		32.75# H-40 ST&C	10-3/4	1481
		20# 8 thd J-55 ST&C	7	3729
Injection		Fiberglass w/epoxy	4-1/2	3385
Other		Hastellay "C"	4-1/2	3625

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 594 sks common cement plus 8% gel.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Diesal oil in annulus; 10-3/4" ST&C Larkin Guide shoe at 1526 ft.; float valve at 1495 ft.; centralizers on 10-3/4" casing at 1495, 1434, 1471, 1378, 1315, and 1155 ft.

5. **Bottom Hole Completion:** Perforations shot with a swing jet at 3352-3302 ft. Plug on bottom, gravel pack, jetted with high pressure nitrogen and detergen

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Sump tank, skimmer-settling tank.

2. **Filters:** Polishing filters and coarse-grained filter.

WIC TX-8

3. **Pumps:** 2-stage centrifugal pump rated at 400 gpm at 1150 foot head. 200 HP electric motor powered.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
6/68	338	360
6/69	318	370
6/70	311	360
6/71	332	364

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
6/68	330	357
6/69	282	380
6/70	434	500
6/71	415	455

3. Annual Volume Injected, gal.
A. 1971 138,000,000 B. 1970 163,373,000 C. 1969 163,810,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by waste.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure rates and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP

Operating Company Name and Address: BP Oil Corporation
P.O. Box 849 - Port Arthur, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 14 (Month) 08 (Year) 72
2. Latitude and Longitude: 29°57'27"/93°53'20"
3. Well Location (Legal Description): Hiram Brown Sruvey, Abstract No. 6
4. County: Jefferson State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Hydrochloric acid from gas production.
2. Date Well Permitted: 6/22/64 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 3417 ft.
6. Name, Age, and Depth of Injection Zone: Miocene sand, 2760-2834 ft.
7. Date Injection Began: (Day) 03 (Month) 12 (Year) 64
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) 11 (Month) 05 (Year) 66
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		sand, clay, silt
Lissie	Pleistocene		1500	sand, gravel
Miocene sand	Miocene	1500	7400	sand, silt, clay

WIC TX-9

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene	
(2) Depth (Ft.)	2800	1500
(3) Thickness (Ft.)	100	1300
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	sand, silt, clay

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay, sand	fresh
Lissie		1500	extensive	sand, clay	potable

4. Mineral Resources in Area: Numerous producing gas wells in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Numerous gas wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 16.97 hydrochloric acid (by weight) chloride, magnesium, calcium sulfate, iron and organics are other constituents.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 16
   - B. Conc. Dissolved Solids, mg/l: 130,000
   - C. Specific Gravity: 1.092
   - D. Temperature: N/A
   - E. pH: 1.0

WIC TX-9

3. Toxicity: Highly toxic due to presence of very high concentration hydrochloric acid and resulting chlorine gas vapors.

4. Reactivity with Surface Equipment Components: Very corrosive to metals.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: None. Bacteria cannot survive at such low pH.

7. Pre-injection Waste Treatment: None

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		54.5#	13-3/8	64
Intermediate		20# T-55 and 23# N-80	7	2036
Injection		Fiberglass w/epoxy	2-1/2	3360
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 15 sks cement, 350 sks Lite Wate cement and 100 sks common; 2 gallons common cement on bottom plug 2902-2911 ft.

3. Well Head Equipment (Name and Models): Cameron Iron Works tubing head with WKM Teflon lined ball valve

4. Packers, Centralizers, and Other Subsurface Equipment: Hastalloy "C" packer at 1455 ft. on 2-1/2 inch casing.

5. Bottom Hole Completion: Perforations: 2834 - 2758 ft.; plug at 2911 ft.; abrasive jetted 2758-2762 and 2826-2834 feet.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Surge tank

2. Filters: None

WIC TX-9

3. Pumps: Two

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Annulus pressure gauge.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi: injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Not to exceed 1000 psi.

Well Id. Code: TX-10

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDC Operational Status: NOUP

Operating Company Name and Address: Pan American Petroleum Company
Edgewood, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 14 (Month) 08 (Year) 72
2. Latitude and Longitude: 32°41'27"/95°50'18"
3. Well Location (Legal Description): N/A
4. County: Van Zandt State: Texas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Cooling tower blowdown, backwash water, Smackover formation water.
2. Date Well Permitted: 7/64 Completed:
3. Injection Rate: 145 gpm
4. Injection Pressure: 300 psi
5. Total Depth of Well: 4900 ft.
6. Name, Age, and Depth of Injection Zone: Woodbine, Cretaceous 4500 - 4700 ft.
7. Date Injection Began: (Day) (Month) 08 (Year) 64
8. Total Volume Injected to Date: 163,211,727 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year) 69
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0		sand, gravel, clay
Wilcox	Tertiary	50	200	sand
Midway	Tertiary	250		
Navarro	Cretaceous			
Taylor	Cretaceous			
Austin	Cretaceous			
Eagle Ford	Cretaceous			
Woodbine	Cretaceous			sand

WIC TX-10

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Woodbine	Midway-Eagle Ford
(2) Depth (Ft.)	4500	250
(3) Thickness (Ft.)	200	4000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	20	
(9) Permeability, millidarcies	800	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand widespread	clay, sand widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	50	200	extensive	sand	fresh

4. Mineral Resources in Area: Oil and gas field on and surrounding disposal site.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling tower blowdown and waste water.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-10

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-Injection Waste Treatment: Oil skimming and solids settling.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer - Brow Chem-Lok at 4581 ft.

5. Bottom Hole Completion: Perforations

6. Hydraulic Fracturing, Acidizing Programs, etc.: 2000 gal. 15% acid

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: two 140' x 150' x 50' holding basins; two 6' x 42' x 3' skimming pits; and one 30' x 30' x 5' burn pit.

2. Filters: N/A

WIC TX-10

3. **Pumps:** Two pumps rated 215 gpm each.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
11/64	125	205
7/65	145	210
7/66	140	200
6/69	168	189

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
11/64	50	130
7/65	285	335
7/66	250	285
6/69	310	320

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-12

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP
Operating Company Name and Address: E.I. DuPont de Nemours and Company
P.O. Box 1089 - Orange, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 17 (Month) 08 (Year) 72
2. Latitude and Longitude: 30°03'26"/93°44'31"
3. Well Location (Legal Description): W.H. Stark Survey, Abstract No. 505
4. County: Orange State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from hydrocarbon oxidation process and process vessel wastes.
2. Date Well Permitted: 8/24/64 Completed:
3. Injection Rate: 270 gpm
4. Injection Pressure: 158 psi
5. Total Depth of Well: 5200 ft.
6. Name, Age, and Depth of Injection Zone: Miocene, 2240 - 2900 ft.
7. Date Injection Began: (Day) 01 (Month) 04 (Year) 65
8. Total Volume Injected to Date: 350,000,000 (Gallons)
9. Date Injection Ceased: (Day) 25 (Month) 08 (Year) 71
10. Previous Mode of Disposal: Discharged into surface bio-oxidation lagoons, and then into the Sabine River.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	900	clay, silt, sand
Lissie	Pleistocene	900	50	sand, silt
Willis	Pliocene			sand
Oakville	Miocene			sandstone
Catahoula	Miocene			sand, sandstone

WIC TX-12

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	2900	
(3) Thickness (Ft.)	660	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, sandstone	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	900	extensive	clay	fresh
Lissie	900	50	extensive	sand, gravel	saline

4. Mineral Resources in Area: Oil and gas.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Three oil and gas tests located on plant site, two other injection wells, 29 oil and gas tests within 2 miles, and 9 within one mile.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste from hydrocarbon oxidation process and process vessel wastes containing monstly nitric, acetic formic and other organic acids.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 54° C
   E. pH: 1.0 - 2.0

3. **Toxicity:** Toxic due to presence of acid.

4. **Reactivity with Surface Equipment Components:** Corrosive to iron and aluminum.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** The low pH provavly insures the initial sterility of the waste solution.

7. **Pre-injection Waste Treatment:** 18000 gallon stainless steel holding tank; polishing filters to remove suspended solids greater than 1 micron.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15-1/2	H-40	9-5/8	1600
Intermediate	8-3/4	SST casing	5-9/16	5250
Injection		SST tubing	3-1/2	2730
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** N/A

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Check valve at 2730 ft. collar intermittent down 5-9/16 inch casing; centralizers on bottom of 9-5/8 inch casing.

5. **Bottom Hole Completion:** Perforated 2550-2580 ft, 2648-2690 ft, 2833-2878 ft, 2904-2920 ft.; plug at 2944 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 18,000 gallon holding tank.

2. **Filters:** Pre-coat filter; two polishing filters.

WIC TX-12

3. **Pumps:** 2 stage centrifugal pump rated up to 450 psi.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
8/65	285	320
" 4/67	179	263
" 3/69	170	215
" 3/71	158	217

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
8/65	330	435
" 4/67	183	210
" 4/69	86	250
" 3/71	158	217

3. **Annual Volume Injected, gal.**

A. 1971 15,450,000 B. 1970 60,709,000 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Well head and annulus pressure; injection flow and volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: TX-13

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Monsanto Company
P.O. Box 711 - Alvin, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 14 (Month) 08 (Year) 72
2. Latitude and Longitude: 22°14'44"/95°12'21"
3. Well Location (Legal Description): Perry and Austin League 2 , Abs. - 107
4. County: Brazoria State: Texas
5. SIC Classification: 2814

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Petrochemical wastes containing significant concentrations of organic nitrogen, nitriles, and other solubles.
2. Date Well Permitted: 9/16/64 Completed:
3. Injection Rate: 352,500,000 gpy
4. Injection Pressure: 400 - 900 psi
5. Total Depth of Well: 6936 ft.
6. Name, Age, and Depth of Injection Zone: Miocene sands, 6926 ft.
7. Date Injection Began: (Day) 26 (Month) 03 (Year) 72
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		clay, sand
Lissie	Pleistocene		1000	sand, gravel, clay
Goliad	Pliocene			sand, gravel, clay
Lagarto	Pliocene			clay
Oakville	Miocene			sand
Catahoula	Miocene			sand, sandstone

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Catahoula	Goliad-Oakville
(2) Depth (Ft.)	6926	1000
(3) Thickness (Ft.)	670	5000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %		
(9) Permeability, millidarcies	150 - 2400	
(10) Reservoir Temperature, °C	50°	
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay, sand	fresh
Lissie		1000	extensive	sand, gravel	fresh

4. Mineral Resources in Area: Oil in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 350 feet south of disposal well is plant fresh water supply - depth 1213 ft.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Nitriles, phenol, organic nitrogen, soluble ether, sulfates and Uranium prior to 10/7/66.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l: 25,000
   C. Specific Gravity: 1.01
   D. Temperature: N/A
   E. pH: 6.9 - 7.5

3. **Toxicity:** Phenol may be toxic to humans; uranium very toxic to humans.

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Pretreated in earthen, diked storage ponds and the pH is adjusted.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			30	60
Intermediate	18-1/2	H-40	16	1547
	15	S-80, N-80, J-55	10-3/4	7497
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16 inch casing - 1346 sks 50-50 Pozmix with 4% gel plus 200 sks common cement; 10-3/4 inch casing - 1400 sks Trinity Lite-Wate; 1060 sks of TLW and 200 sks common + 40% $CaCl_2$ spotted between 16" and 10-3/4" casing (0-250 ft.)

3. **Well Head Equipment (Name and Models):** Casing head 10-3/4" 8rd female Cameron type WF with 2-series 1500 F.E. outlets and 10" series 1500 flange: 2-2" series 1500 F.E. Cameron"F" gate valves 500 FWP

4. **Packers, Centralizers, and Other Subsurface Equipment:** Halliburton"DV" tool set in 10-3/4" casing at 1995 ft.; Betz inhibitor at 708 and 808 ft.

5. **Bottom Hole Completion:** 10-3/4 inch casing perforated with 2400. 1/2" bullets between 6256 and 6936 feet.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with 6000 gallons of mud acid and 4000 gallons of 15% HCl and brine.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Three ponds

2. **Filters:** Fine gravity sand filter.

3. **Pumps:** Centrifugal.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	1/66	Average	395	Maximum	480
"	1/68		785		1040
"	1/70		736		888
"	1/72		919		945

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1/66	Average	463	Maximum	500
"	1/68		930		1000
"	1/70		460		540
"	1/72		590		670

3. Annual Volume Injected, gal.
A. 1972 233,975,000 B. 1971 428,596,000 C. 1970 458,316,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Divert flow to holding ponds.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Not to exceed 38,850,000 gallons monthly

Well Id. Code: TX-14

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Celanese Chemical Company
P.O. Box 509 - Bay City, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 17 (Month) 08 (Year) 72
2. Latitude and Longitude: 28°52'01"/96°01'02"
3. Well Location (Legal Description): James Moore League, Abs. No. 62
4. County: Madagorda State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from production of petroleum chemicals: acetaldehyde, adipic acid, butanol and others.
2. Date Well Permitted: 6/28/65 Completed:
3. Injection Rate: 128,402,673 gpy
4. Injection Pressure: 200 - 450 psi
5. Total Depth of Well: 3780 ft.
6. Name, Age, and Depth of Injection Zone: Tertiary sands, 3300 ft.
7. Date Injection Began: (Day) (Month) 02 (Year) 65
8. Total Volume Injected to Date: 808,936,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Aeration pond treatment to Colorado River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		clay, sand
Lissie	Pleistocene		1300	sand, gravel, clay
	Pliocene	1300	2400	sand, clay
Miocene sand	Miocene	3700		sand, clay

(a)

WIC TX-14

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	3300	1300
(3) Thickness (Ft.)		2000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Tertiary	Tertiary
(8) Porosity %	27.2 - 35.7	
(9) Permeability, millidarcies	193 - 1389	
(10) Reservoir Temperature, °C	63° at 3491 ft.	
(11) Character and Areal Distribution	sand	shale, clay

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay	fresh
Lissie		1300	extensive	sand, gravel	fresh to brackish

4. Mineral Resources in Area: Oil and gas deposits in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 34 oil test wells within 3 mile radius -26 are dry and ababdoned, 4 are abandoned producers and 4 currently are producing; depth of these holes ranges from 8,000 to 11,000 feet.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Wastes from production of acetaldehyde, adipic acid, butanol, and other petrochemicals from hydrocarbon feed stacks.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 50
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 120° F
   E. pH: 5.0 - 9.0

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Minor corrosion due to pH fluctuations.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: 500,000 gallon surge tank equipped with a skimmer, three carbon filters and three polishing filters.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		H-40	13-3/8	1357
Intermediate	12-1/4	40# J-55	9-5/8	3750
Injection		15.5# J-55	5-1/2	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 200 sks common with 2% $CaCl_2$ and 460 sks Longhorn common with 16% gel and 5% $CaCl_2$; 9-5/8 inch casing - 501 sks Lone Stat Incor and 501 sks 50-50 Pozmix "A" cement with 2% gel.

3. Well Head Equipment (Name and Models): 7" Oct type T115A

4. Packers, Centralizers, and Other Subsurface Equipment: Float collar at 3717 ft.; T1W Seal and packer at 3208 ft.; 20 spaced centralizers and 37 scratchers on 9-5/8" casing; plugging on bottom - 10# SW plug.

5. Bottom Hole Completion: Jet perforated 3520 - 3550 (240 shots per 8 ft.)

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 500,000 gallon surge tank

2. Filters: Three carbon filters; three polishing filters.

WIC TX-14

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	5/65	Average	172	Maximum	205
"	6/68		378		470
"	6/69		377		476
"	6/71		136		202

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	5/65	Average	200	Maximum	256
"	6/68		344		449
"	6/69		315		376
"	6/71		284		348

3. Annual Volume Injected, gal.
A. 1971 39,398,840 B. 1970 136,255,000 C. 1969 181,450,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi: injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Permitted at 200 gpm at maximum 1000 psi.

Well Id. Code: TX-15

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC

Operating Company Name and Address: BP Oil Corp.
P.O. Box 849, Port Arthur, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 18 (Month) 8 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Hiram Brown Survey, Abstract 6
4. County: Jefferson State: Texas
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: 10/29/64 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC ____________ TX-15 ____________

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: ____________

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: ____________

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: ____________

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): ____________

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: ____________
   B. Conc. Dissolved Solids, mg/l: ____________
   C. Specific Gravity: ____________
   D. Temperature: ____________
   E. pH: ____________

WIC TX-15

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-16

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: El Paso Petroleum Chemical Complex
Nylon Plant, Box 3986 - Odessa, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 17 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 31°49'25"/102°20'07"
3. **Well Location (Legal Description):** T&P RR Survey, Block 42, T-25, Section 47 located 200 ft. south of the north line and 2,500 feet west of the east line
4. **County:** Ector **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Nylon production wastes with ammonia, adipic acid, nitric acid, and hexaethylenediamine in low concentrations - the rest mixed with the Odessa treatment plant effluent into Monahans Draw
2. **Date Well Permitted:** 3/30/65 **Completed:**
3. **Injection Rate:** 183,396,028 gpy
4. **Injection Pressure:** 1,000
5. **Total Depth of Well:** 5,800 ft.
6. **Name, Age, and Depth of Injection Zone:** San Andres Limestone, Permian, 4900
7. **Date Injection Began: (Day)** **(Month)** 11 **(Year)** 65
8. **Total Volume Injected to Date:** 1,100,156,166 **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Water sold to Pan American Petroleum Corp. for use in secondary water flood projects - use of secondary recovery and reuse, then land disposal.

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Tertiary		50	Alluvium
Comanche	Cretaceous	50	100	Sand, limestone
Dockum	Triassic	150	1,220	Sandstone
Ochoa	Permian	1,370	1,250	Limestone, salt, dolomite
Guadalupe	Permian	2,620	2,280	Limestone, dolomite
San Andres	Permian	4,900	900	Limestone, dolomite

WIC TX-16

B. **Geologic Description of Injection Unit and Other Possible Units**

		Injection Unit	Confining Bed
(1)	Name	San Andres	Guadalupe-Dockum
(2)	Depth (Ft.)	4900	150
(3)	Thickness (Ft.)	900	4,750
(4)	Formation Fluid Pressure, psi		
(5)	Lithostatic Pressure, psi		
(6)	Hydrofracturing Pressure, psi	2,500	
(7)	Age of Unit	Permian	Permian & Triassic
(8)	Porosity %	12	
(9)	Permeability, millidarcies	7	
(10)	Reservoir Temperature, °C		
(11)	Character and Areal Distribution	Limestone, dolomite very extensive	Extensive with massive limestone layers

C. **Chemical Characteristics of Formation Fluids:** TDS 22,000 mg/1, 11,000 mg/1 Cl-, 6,000 mg/1 Na+, 1,300 mg/1 Ca++.

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	0	(Combined-		sand, limestone	fresh used for
Comanche		125 ft.)			municipal, indus-
					trial & domestic
					supply

4. **Mineral Resources in Area:** N/A

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** No unplugged wells reaching down to the San Andres formation in the Odessa area; 5 L&P storage cavities in Salado Salt (2,200-2,800 ft.) ElPaso xIC Products Company; Headlee Field approximately 4 mi. NE; Foster Field NW of Odessa; South Cowden Oil Field

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Organics, chloride, sulphates, chromium, copper, iron, and zinc, nitric and adipic acid.

2. **Physical/Chemical Description**
   - A. **Conc. Suspended Solids, mg/l:** 16-95
   - B. **Conc. Dissolved Solids, mg/l:** 8,600-208,000
   - C. **Specific Gravity:** N/A
   - D. **Temperature:** N/A
   - E. **pH:** 3.3-9.0

(b)

3. **Toxicity:** High salinity makes its willful ingestion unlikely. However, the high salinity also confers toxicity on this wastewater.

4. **Reactivity with Surface Equipment Components:** Would at least have the corrosive properties of seawater.

5. **Degradability Level and Rate:** None; the oxidative degradation of the small organic component is not very likely in the deep well context.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Unknown, but not very encouraging in its strongly saline environment.

7 **Pre-injection Waste Treatment:** Collected in Gulf Sea Pond, filtered and sent to a holding tank prior to injection.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	J-55 61# steel	13-3/8	502
Intermediate	12-1/4	J-55 36-40#	9-5/8	4,900
Injection	7-13/16	J-55 Penton Coated Steel	5-1/2	4,900+
Other		Tubing 0.304 inch wall 17#		

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 - 500 sks neat cement with 2% CaCl$_2$ 9-5/8 - 820 sks Incor cement plus 12% NaCl - 1,100 sks. Incor Pozmix with 4% Gel. & 26# NaCl/sack inhibitor fluid in between 9-5/8 and 5-1/2 casing.

3. **Well Head Equipment (Name and Models):** 6 inch master control, 2,000 psi working pressure well head.

4. **Packers, Centralizers, and Other Subsurface Equipment:** 13-3/8 Halliburton insert float collar set at 469 ft., 4 centralizers S-3 9-5/8 rubber packer at 4,900 ft., stage tool at 3,000 ft. 5-1/2 packer set in shoe joint of 9-5/8 inch casing set at 4,900 ft.

5. **Bottom Hole Completion:** 7-13/16 open hole set to 5,800 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 800 Bbl of 7% HCl @ 100 BPH.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 50,000 gal. holding pond which is line with asbestos and cement.

2. **Filters:** N/A

WIC TX-16

3. **Pumps:** Three triplex pumps

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	10/71	**Average**	31	**Maximum**	896
"	10/70		435		1,072
"	10/67		660		800
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	10/71	**Average**	790	**Maximum**	900
"	10/70		900		1,210
"	10/67		400		680
"					

3. **Annual Volume Injected, gal.**

A. 19__ B. 1971 157,825 C. 1970 388,861

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Pressure gages installed on well head and on the tubing-casing annulus.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous with reports submitted bi-yearly within the limits of 5% error.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for 1,000 psi minimum.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report bi-annually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Operating surface pressure not to exceed 2,500 psi.

Well Id. Code: TX-17

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Gulf Oil Corporation
P.O. Box 72 - Kilgore, Texas 75662

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 16 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 32°59'31"/95°29'30"
3. **Well Location (Legal Description):** Nacoadaches University Survey, Ab. No. 73 Hopkins County, Texas
4. **County:** Hopkins **State:** Texas
5. **SIC Classification:** 1321

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Cooling tower and boiler blowdown, process waste water produced Smackover water.
2. **Date Well Permitted:** 5/3/65 **Completed:**
3. **Injection Rate:** 15,044,900 gpy
4. **Injection Pressure:** 450-700 psi
5. **Total Depth of Well:** 5,213 ft.
6. **Name, Age, and Depth of Injection Zone:** Woodbine Sand, Cretaceous, 4450 ft.
7. **Date Injection Began: (Day)** 18 **(Month)** 05 **(Year)** 65
8. **Total Volume Injected to Date:** 105,314,297 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Eocene	0	420	shale, sandstone
Midway	Eocene	420	880	shale, sandstone
Navarro	Cretaceous	1300	700	shale
Taylor	Cretaceous	2000	900	shale, limestone
Austin	Cretaceous	2900	1000	shale, limestone, sandstone
Eagle Ford	Cretaceous	3900	550	sandstone, shale
Woodbine	Cretaceous	4450	700	sandstone
Washita	Cretaceous	5150	1000	limestone, shale

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Woodbine	Midway-Eagle Ford
(2) Depth (Ft.)	4450	420
(3) Thickness (Ft.)	700	4000
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %		
(9) Permeability, millidarcies	4,000	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone-sand with thin discontinuous intercalated shale	shale and sand

C. Chemical Characteristics of Formation Fluids: Saline water, TDS = 51,800 ppm, Chloride = 27,00 ppm.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	Surf.	420		sandstone, shale	Fresh

4. Mineral Resources in Area: The well is in the Como oilfield area. Oil production began in the Como field in 1947 from the Coker sand at about 4200 ft. Subsequent production has been found at 4,000 ft. and at 8,000 ft.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Yantis Plant (6 mi. SW of injection site) injects into Woodbine zone as well as Edgewood Plant (30 mi. SSE); 5 wells are plugged that reach the Woodbine zone that are in the immediate area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Caustic wash treatment (5 gpm) Amine backwash (10 gpm), cooling tower blowdown (30 gpm), desalting treatment (18 gpm) boiler water blowdown (5 gpm), formation salt water (2-30) gpm)

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: N/A

B. Conc. Dissolved Solids, mg/l: N/A

C. Specific Gravity: N/A

D. Temperature: N/A

E. pH: N/A

3. **Toxicity:** The extremely high salt content would make the water difficult to drink. For the same reason, however, it would be toxic.

4. **Reactivity with Surface Equipment Components:** Would at least be as corrosive as seawater. Additionally, its alkalinity would attack aluminum very readily.

5. **Degradability Level and Rate:** None, although the loss of the bicarbonate function would cause solids precipitation.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Unknown, although hardly likely to be sterile.

7. **Pre-injection Waste Treatment:** Oil skimming and settling of solids.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	H-40 2#	8-5/8	1,960.8
Intermediate		J-55 15.5#	5-1/2	5,140
Injection		Internal plastic coated	2-7/8	4,726
Other		steel tubing		

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 515 sacks common cement with 8% Gel. and 200 sacks Neat common cement w/2% $CaCl_2$; 5-1/2 inch casing - 430 sacks common cement with 8% Gel. and 300 sacks of Neat cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer set at 4,726 ft. 8-5/8 in O.D. Larkin Co. mb F.G. Shoe w/8 Rnd.Thrd. and w/M&F 3 RND. Thrd. Flat Collar; 5-1/2" casing - 54 centralizers 1,900-5,200 ft. 8-5/8" casing 5 centralizers;34° API Gravity Kerosene in TB6-CSG Annulus-water interface

5. **Bottom Hole Completion:** Perforated 4940-5140

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 8,000 barrel gunite-lined storage pit used for oil skimming and settling of solids and a plastic lined pit is used for storage of water.

2. **Filters:** N/A

WIC TX-17

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	18	65,058
7/71	32	80,346
7/67	39	83,664
7/66	54	116,046

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	443	568
7/71	451	617
7/67	583	725
7/66	761	904

3. **Annual Volume Injected, gal.**
A. 1972 7,054,238 B. 1971 12,359,142 C. 1970 8,544,632

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1,000 psi.; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Well head pressure shall not exceed 3,000 psi.

Well Id. Code: TX-18

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address:
Shell Oil Company
N.W. Ozona Gas Plant - P.O.Box 1509
Midland, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** N/A
3. **Well Location (Legal Description):** 700 ft. south of the north line and 1750 ft. west of the east line of the sec. 46, F.R. Henderson Lease
4. **County:** Crockett **State:** Texas
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Cooling tower blowdown and zeolite regeneration waste water.
2. **Date Well Permitted:** 6/14/65 **Completed:**
3. **Injection Rate:** 8,000 gpd
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 1750
6. **Name, Age, and Depth of Injection Zone:** San Andres, Permian, 1000
7. **Date Injection Began: (Day)** **(Month)** 05 **(Year)** 65
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Comanche	Cretaceous			sand, sandstone
Whitehorse	Permian		250	sand, shale
San Andres	Permian	1000	1500	limestone, dolomite

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	San Andres	
(2) Depth (Ft.)	1000	
(3) Thickness (Ft.)	1500	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Permian	
(8) Porosity %	15.0	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, dolomite	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Edwards				limestone	TDS-4000 ppm

4. Mineral Resources in Area: Oil is produced from the Canyon Group at 6,675 ft.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling tower blowdown and zeolite regeneration wash water with magnesium, calcium, sodium, bicarbonate, chloride.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 2230
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 8.5

(b)

WIC TX-18

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate		J-55 9.5#	4-1/2	1094
Injection				
Other			1	1084

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Sur. 200 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Open hole 1084 - 1750 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 35' x 27' polyvinyl lined settling tank plus 300' plastic tubing.

2. **Filters:** N/A

WIC TX-18

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12-70	Average	7.5	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12-70	Average	500	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Surface injection pressure is limited to 650 psi.

Well Id. Code: TX-20

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** 0

Operating Company Name and Address: Diamond Shamrock Oil and Gas Company
P.O. Box 631 - Amarillo, Texas 79105

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 16 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 35°57'28"/101°52'31"
3. **Well Location (Legal Description):** H&T C RR Survey, Section 399, Block 44, located 1,053 ft. from north line and 1,980 ft. from the west line
4. **County:** Moore **State:** Texas
5. **SIC Classification:** 1311

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Cooling tower and boiler blowdown water with traces of nitrogen, hydrocarbons, and chromates.
2. **Date Well Permitted:** 5/24/56 **Completed:**
3. **Injection Rate:** 160,391,366
4. **Injection Pressure:** 200 psi
5. **Total Depth of Well:** 1,620
6. **Name, Age, and Depth of Injection Zone:** Glorietta Sand, Permian, 1108
7. **Date Injection Began: (Day)** **(Month)** 07 **(Year)** 65
8. **Total Volume Injected to Date:** 1,042,443,875 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Surface discharge around Palo Duro Creek from earthen pits and direct discharge to creek.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	Surface		Alluvium
Ogallala	Pliocene		450	Sandstone, silt, clay
Dockum Group	Triassic			Shale
Blaine Gypsum	Permian			Gypsum, anhydrite
Glorietta	Permian	1108	132	Sandstone

WIC TX-20

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Glorietta	
(2) Depth (Ft.)	1116	450
(3) Thickness (Ft.)	120	650
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Permian	Triassic & Permian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandstone, widespread	red shale & evaporites widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala		450		sand, silt, clay, gravel	fresh water

4. Mineral Resources in Area: Oil and gas from numerous wells in the area

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Two Shamrock wells in the Glorietta sand used for disposal WDW-3 (TX-3) 4 mil. SW

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling tower and boiler blowdown water with traces of nitrogen, hydrocarbons, and chromate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 7.5-8.5

3. **Toxicity:** Non-toxic, but undoubtedly unpleasant to taste.

4. **Reactivity with Surface Equipment Components:** Essentially unreactive, although slight alkalinity could have some slight effect on aluminum

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Flotator and clarifier tank to a concrete settling basin where cooling tower and boiler water effluent are added. pH control to 7.5 to 8.5.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32.3# H-40	13-3/8	603
Intermediate		20# J-55	7	1,425-1,620
Injection		32.3# H-40	9-5/8	1,551
Other		20# J-55	7	1,089

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 inch casing - 400 cu. ft. Pozmix cement with 10,000#s Gilsonite 9-5/8 inch casing - cement 660 - 1,382 ft. at least (450 sacks cement)

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Two foot Baker cast iron bridge plug set in 9-5/8 inch casing from 1,300-1,302 ft. 7 inch casing Brown type DL Packer.

5. **Bottom Hole Completion:** Lane Wells Co. perforating gun forms a 0.489 inch hole one hole per foot - 1,116-1,236 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 1,000 gal. of 15% mud acid.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Unlined earthen pit 800' x 1,000' x 50' concrete settling basin and concrete mixing basin.

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	**Average**	**Maximum**
12/71	182	235
" 12/70	191	210
" 12/69	298	470
" 12/66	458	742

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	**Average**	**Maximum**
12/71	182	210
" 12/70.	178	210
" 12/69	144	175
" 12/66	64	125

3. **Annual Volume Injected, gal.**
A. 1971 102,811,600 **B.** 1970 148,013,612 **C.** 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. Monitoring Devices and Data: Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. Construction Requirements: All casing must be tested for leakage at 1,000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually; 5% deviations report immediately.

C. Restrictions of Operation Procedures: Operating surface equipment shall not exceed a maximum of 300 psi.

Well Id. Code: TX-21

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP
Operating Company Name and Address: Mobile Chemical Company
P.O. Box 631, Amarillo, Texas 79105

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 11 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 29°58'19"/94°03'49"
3. **Well Location (Legal Description):** W.N. Sigler Survey, Ab. 48, 4560 ft. from the north line and 3480 ft. from the west line.
4. **County:** Jefferson **State:** Texas
5. **SIC Classification:** 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Acetic acid, terephthalic acid, xylene, methyl ethyl ketone, paratoluic acid, and other hydrocarbons.
2. **Date Well Permitted:** 6/21/65 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 5,999 ft.
6. **Name, Age, and Depth of Injection Zone:** Catahoula, Miocene, 3,500-5,700 ft.
7. **Date Injection Began: (Day)** **(Month)** 01 **(Year)** 67
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** 05 **(Month)** 03 **(Year)** 70
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont Clay	Pleistocene	0	600	sand and clay
Lissie	Pleistocene	600	400	sand and clay
Willis	Pliocene			sand
Goliad	Pliocene			
Catahoula	Miocene	3,500		sand, gravel, silt

WIC TX-21

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sands	
(2) Depth (Ft.)	3,500	1,000
(3) Thickness (Ft.)		4,500
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	0.4-0.8 psi/ft.	
(7) Age of Unit	Miocene	Miocene & Pliocene
(8) Porosity %	30	
(9) Permeability, millidarcies	500	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, silt & gravel	clays and sands

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont Clay	0	600	extensive	sand, clay	fresh
Lissie	600	400	extensive	sand, clay	slightly saline

4. Mineral Resources in Area: Oil and gas in general area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Spindletop Oilfield 2 miles north; TX-9 is 13 miles S.E.; TX-12 30 miles E; Lovell Lake Oil and Gas Field is 2-1/2 miles WSW.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid 2,240 ppm, terephthalic acid 150 ppm, xylene 55 ppm, methyl ethyl ketone 50 ppm paratoluic acid 40 ppm, benzoic acid 20 ppm, other hydrocarbons 24 ppm.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 2000-3000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 3-4

3. **Toxicity:** While none of the above components is a systemic poison, the mixture is undoubtedly toxic and irritating to tissue in its degree of acidity. Dilution will reduce the toxicity, but not of the water-insoluble xylene
4. **Reactivity with Surface Equipment Components:** Corrosion of liner caused well to be abandoned.
5. **Degradability Level and Rate:** Organic materials will eventually be altered by oxidation; minimally under the subject conditions.
6. **Biological Level at Injection and Estimated Biological Level After Injection:** Unknown. The paratoluic acid in particular is a strong acid unfriendly to the growth of organisms.
7. **Pre-injection Waste Treatment:** pH control, biological treatment - BOD removal, and settling.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		surface casing	10-3/4	1014
Intermediate			7-5/8	5999
Injection		tubing	4-1/2	5950
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 765 sks. Lite Wate; 7-5/8 inch casing - 1800 sks 50/50 Pozmix plus 2% gel; 4-1/2 inch casing - 900 sks Pozmix plus 2% gel.
3. **Well Head Equipment (Name and Models):** N/A
4. **Packers, Centralizers, and Other Subsurface Equipment:** Armco Seal Lock @ 5950 ft.
5. **Bottom Hole Completion:** Perforations 5468-5890 ft.
6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 7000 gal. of 3% HF and 15% HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2 - 10,000 barrel welded aluminum holding tanks, concrete basin 12'x15'x12'
2. **Filters:** Fixed bed anthracite filter.

WIC TX-21

3. **Pumps:** Centrifugal.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

3. **Annual Volume Injected, gal.**
A. 19 70 10,471,532 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1,000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report bi-annually; 5% deviations report immed.

C. **Restrictions of Operation Procedures:** Well plugged according to TWOB regulations - injection ceased 3/5/70.

Well Id. Code: TX-22

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDC **Operational Status:** NOUP

Operating Company Name and Address: Mr. B. C. Aughtry - Aughtry Flowers
802 S. Clements - Gainsville, Texas 76240

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 11 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 30°37'46"/97°07'31"
3. **Well Location (Legal Description):** 2400 ft. from the south line and 800 ft. from the east line of the M.E. Clark Survey, Ab. 231.
4. **County:** Cooke **State:** Texas
5. **SIC Classification:** 5900

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Acidic (H_2SO_4) backwash water used to regenerate a hydrogen zeolite bed for conditioning raw water.
2. **Date Well Permitted:** 7/26/65 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** gravity
5. **Total Depth of Well:** 32 feet
6. **Name, Age, and Depth of Injection Zone:** Alluvial deposit, Recent, 28-42 ft.
7. **Date Injection Began: (Day)** **(Month)** **(Year)** 65
8. **Total Volume Injected to Date:** 16,686 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvial deposits		15	3	gravel bed
Alluvial deposits		28	14	gravel bed
Denton	Cretaceous	50		clay
Kiamichi	Cretaceous	200	20	limestone
Goodland	Cretaceous	220	40	limestone
Trinity group	Cretaceous	260	700	

WIC TX-22

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	gravel zone	
(2) Depth (Ft.)	28	
(3) Thickness (Ft.)	14	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Recent	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	gravel	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Trinity	260	700	massive	sandstone	principal fresh aquifer

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Ground water wells which reach the Trinity formation for fresh water.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium, bicarbonate

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l: 598
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 9.2

WIC TX-22

3. **Toxicity:** Non-toxic

4. **Reactivity with Surface Equipment Components:** Relatively high pH solution may corrode aluminum fixtures through continued application.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection and biological activity minimized by anaerobic conditions and lack of organic substrate.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection		Steel	3-1/2	29
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-22

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		Average		Maximum	
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)		Average		Maximum	
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 1972 2,052 B. 1971 3,348 C. 1970 5,071.5

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1,000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report bi-annually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: TX-23

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP

Operating Company Name and Address: E.I. DuPont De Nemours and Company
P.O. Box 1089 - Orange, Texas 77630

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 16 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 30°03'26"/93°44'31"
3. **Well Location (Legal Description):** O.M. Thomas Survey, Ab. 433, 440 ft. from the southwest line and 343 ft. from the southeast line.
4. **County:** Orange **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** A dilute aqueous solution of ammonium sulfate, sulfuric acid, organic nitriles and trace quantities of hydrogen cyanide.
2. **Date Well Permitted:** 8/30/65 **Completed:**
3. **Injection Rate:** 340 gpm
4. **Injection Pressure:** 700-830 psi
5. **Total Depth of Well:** 5,204
6. **Name, Age, and Depth of Injection Zone:** Catahoula, Miocene - 4,550
7. **Date Injection Began: (Day)** 25 **(Month)** 10 **(Year)** 66
8. **Total Volume Injected to Date:** 749,817,905 **(Gallons)**
9. **Date Injection Ceased: (Day)** 19 **(Month)** 05 **(Year)** 72
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont Clay	Pleistocene	0	combined	clay, sand
Lissie	Pleistocene	thickness	-1,000 ft.	sand, gravel
Willis	Pliocene			sand
Oakville	Miocene			sand
Catahoula	Miocene	4,550	800	sand

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Catahoula	
(2)	Depth (Ft.)	4,550	1,000
(3)	Thickness (Ft.)	800	3,500
(4)	Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5)	Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7)	Age of Unit	Miocene	Tertiary
(8)	Porosity %		
(9)	Permeability, millidarcies		
(10)	Reservoir Temperature, °C		
(11)	Character and Areal Distribution	sand	sands and clays

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont clay	0	combined	extensive	sand,clay	freshwater in top
Lissie		thickness-1000	extensive	gravel,sand	400 ft. with 3000
					ppm TDS

These two formations are often referred to as the Gulf Coast aquifer.

4. Mineral Resources in Area: Oil and gas in area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Phoenix Lake oil and gas field three miles east; Orange field three miles west of the disposal well.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): The waste fluid contains 1% nitric acid, 2.3% organic acids, and 0.01% heavy metal salts.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-23

3. **Toxicity:** Heavy metals and cyanides are toxic if ingested.

4. **Reactivity with Surface Equipment Components:** Sulfuric, nitric, and organic acids may corrode metal fixtures with continued contact.

5. **Degradability Level and Rate:** Organic material may break down chemically and through bacterial degradation.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection. Possibly some breakdown of organic compounds with oxygen supplied through decomposition of SO_4, NO_3, and CO_3

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-23

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	12/70	Average	255	Maximum	355
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	12/70	Average	723	Maximum	830
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company wells in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1,000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Plugged.

Well Id. Code: TX-25

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP
Operating Company Name and Address: Mobile Oil Company
P.O. Box 633 - Midland, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 16 (Month) 09 (Year) 72
2. Latitude and Longitude: 31°10'32"/103°01'49"
3. Well Location (Legal Description): T.T. Ry Survey, Sec. 48, Block OW, 2090 ft. from the north line and 721 ft. from the south line.
4. County: Pecos State: Texas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Produced brine, waste water from desalting and regeneration, glycol, caustic soda, and boiler blowdown.
2. Date Well Permitted: 2/23/66 Completed:
3. Injection Rate: 56 gpm
4. Injection Pressure: 650-800 psi
5. Total Depth of Well: 6,250 ft.
6. Name, Age, and Depth of Injection Zone: Cherry Canyon, Permian, 5,631 ft.
7. Date Injection Began: (Day) 19 (Month) 08 (Year) 66
8. Total Volume Injected to Date: 87,225,965 (Gallons)
9. Date Injection Ceased: (Day) 14 (Month) 08 (Year) 72
10. Previous Mode of Disposal: N/A

III.. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Rustler	Permian	1,825	2,200	Anhydrite
Lamar	Permian	4,680	60	limestone
Bell Canyon	Permian	4,740	300	
Cherry Canyon	Permian	5,631	600	sandstone, dolomite

(a)

WIC TX-25

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Cherry Canyon	
(2) Depth (Ft.)	5,631	
(3) Thickness (Ft.)	600	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Permian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone, dolomite	

C. Chemical Characteristics of Formation Fluids: 15,646 mg/l chloride ions, total solids - 21,833 mg/l.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium			extensive	sand, gravel	fresh
Rustler	1,850	400		sandstone	saline

4. Mineral Resources in Area: Oil and gas in five zones from 4,700 ft. to 15,700 ft.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Irrigation wells of area are 1,000 ft. depth at maximum, most ground water from alluvial and gravel deposits of Tertiary Age. This area has vast oil and gas wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Total alkalinity - 552 ppm, total hardness - 4,240 ppm, Ca - 2932 ppm, Mg - 1,309 ppm K - 13, 421 ppm, SO_4 - 36 ppm, Cl - 39,987 ppm, Fe-15.2 ppm, CO_{-2} - 28 ppm.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.0318 at 60° F
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** High alkalinity and solids precludes willful ingestion because of bad taste, similar to seawater. Would have physic effect because of high Mg content. Fe would have heavy metal effect. No systemic poisons.

4. **Reactivity with Surface Equipment Components:** Alkalinity and high chlorides would corrode iron and aluminum in an action similar to that of sea water.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8-5/8	1855
Intermediate		J-55	5-1/2	6245
Injection				
Other		J-055 4.71#	2-3/4	5086

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 868 sks Incore cement plus 4% gel., 1/4# Celfo hole per sack and 2% $CaCl_2$ and 100 sks neat Incore and 2% $CaCl_2$

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** One centralizer on 8-5/8 inch casing on bottom joint. Packer - Brown Oil Tool Husley Type set at 5086 ft.

5. **Bottom Hole Completion:** Perforations at 5168-5594 ft., 5693-6046 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	58	58
6/71	58	58
6/70	56	60
6/69	54	56

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	650	700
6/71	725	750
6/70	700	750
6/69	750	900

3. **Annual Volume Injected, gal.**
A. 1972 6,734,490 B. 1971 8,524,444 C. 1970 17,979,976

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1,000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Maximum operational surface pressure injection of 2,500 psig - well operation ceased August 14, 1972. Well plugged under TWQR regulations.

Well Id. Code: TX-26

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP
Operating Company Name and Address: Phillips Petroleum Company
P.O. Box 1967 - Houston, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 09 **(Year)** 72
2. **Latitude and Longitude:** 32°30'36"/99°45'10"
3. **Well Location (Legal Description):** Five feet east of west line which trends N14°25'W of 2.48 acre tract in west part of Sec. 48, Blk. 16, T&P RR Co. Survey
4. **County:** Jones **State:** Texas
5. **SIC Classification:** 5541

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Wastewater from truck washings at service station, detergents, and small amounts of gasoline, kerosene, motor oil, and grease.
2. **Date Well Permitted:** 7/26/66 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 400 ft.
6. **Name, Age, and Depth of Injection Zone:** Talpa Limestone - 250-500 ft.
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** 14 **(Month)** 03 **(Year)** 72
10. **Previous Mode of Disposal:** Gravel pit drainage ditch covered with soil after settleable solids had been removed.

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Clear Fork	Permian	0		
Wichita	Permian			limestone, shale
Talpa Limestone	Permian	300	100	limestone
Coleman Junction Limestone	Permian	600	750	limestone

WIC TX-26

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Talpa Limestone	
(2) Depth (Ft.)	300	
(3) Thickness (Ft.)	100	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Permian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Limestone	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Coleman Junction	600	750		limestone	brackish - artesian sufficient to reach surface

4. Mineral Resources in Area: Oil and gas fields surround the disposal well site location. Sayles field, 1 mile north, at a depth of 2,000 ft.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Sayles oil field, 1 mile north produces oil from Flippen limestone (2,000 ft); seven abandoned wells within one mile radius (nearest 900 ft. south).

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Effluent from truck washing facility.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 443
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 7.8

WIC TX-26

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection, biological activity minimal due to anaerobic conditions and lack of substrate.

7. Pre-injection Waste Treatment: Wash bays run to 6'x6'x6' cement lined settling box equipped with a baffle. Overflow runs into a steel holding tank 6' diameter and 7-8' deep. A drainfield 10'x65'x10' filled with gravel and covered with soil takes the not injected waste fluid.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection		Casing 9.5# J-55	4-1/2	400
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 50 sks cement from 400 ft. to 3 ft. below ground level. Class H cement was used.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforations were from 250-400 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 6'x6'x6' cement lined settling box; 6' diameter x 7 to 8' deep steel holding tank; and 10'x65'x10' gravel filled and dirt covered drainage field.

2. Filters: N/A

WIC TX-26

3. **Pumps:** Electrip pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** Abandoned well reworked to permit specifications - now plugged to permit specifications.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Operating pressure not to exceed 1/2 psi/ft. permit cancelled and well plugged according to TWQB regulations - injection ceased March 14, 1972.

Well Id. Code: TX-27

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Calallen Independent School
4602 Cornell Drive - Corpus Christi, Texas 78410

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 17 (Month) 10 (Year) 72
2. Latitude and Longitude: 27°51'15"/97°38'12"
3. Well Location (Legal Description): 510 ft. west of the line and 307 ft. north of the 30 acre tract of the F.J. Smith 225.2 acre tract.
4. County: Nueces State: Texas
5. SIC Classification: 8299

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Effluent from septic tank system.
2. Date Well Permitted: 9/19/66 Completed:
3. Injection Rate: 5,600 gpd
4. Injection Pressure: gravity
5. Total Depth of Well: 349 ft.
6. Name, Age, and Depth of Injection Zone: Goliad, Pliocene, 300 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: 2 - 4,000 gallon septic tanks connected in series and two 600 gallon septic tanks connected in series, whose effluents gravity flow to a drainage field consisting of 24 wells.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont Clay	Pleistocene	0		sand, shale
Lissie	Pleistocene			sand, shale
Golaid	Pliocene	300	50	sand

WIC TX-27

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Goliad	Lower Beaumont clay
(2) Depth (Ft.)	300	& Lissie Fm.
(3) Thickness (Ft.)	50	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	Pleistocene
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Fine, coarse, broken sand, and sandstone with shale	sand, shale

C. Chemical Characteristics of Formation Fluids: Water with high chloride concentrations.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont				sand/shale	usable water

4. Mineral Resources in Area: ODEM Oil Field five miles north and SAXET Oil Field 7 miles southwest.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Wells drilled deeper than 100 ft., with quality suitable for domestic use, are more than three miles from the disposal well site.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): BOD's - 170 mg/l

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 8.2

WIC TX-27

3. Toxicity: Possible pollution by bacterial population.

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Bacteriologically detrimental to quality of potable ground water - large bacterial count.

7. Pre-injection Waste Treatment: 3 septic tanks for anaerobic digestion of raw waste and settling of suspended solids.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Casing	4	349
Intermediate				
Injection		Tubing	2	293
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 4 inch casing cemented 300 ft. to surface.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 4"x2" packer at 293 ft.

5. Bottom Hole Completion: 4 inch casing slotted 303-349 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Three - concrete septic tanks with total capacity of 9,200 gallons.

2. Filters: N/A

WIC TX-27

3. **Pumps:** 2 H.P. Electric Motor and a Myers Piston Pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	10/4/71	Average	100	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	10/4/71	Average	Vacuum	Maximum	10
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure gauge on injection tubing.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1,000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually; 5% deviations report immed.

C. Restrictions of Operation Procedures: Surface injection pressure shall not exceed 1/2 pound per foot of depth.

Well Id. Code: TX-28

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: E.I. DuPont de Nemours and Company
P.O. Box 2626 - Victoria, Texas 77901

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 17 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 28°39'30"/96°56'15"
3. **Well Location (Legal Description):** 3835 ft. from the northwest line and 21,340 ft. from the northeast line of the Disideria Garcia League Survey.
4. **County:** Victoria **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Aqueous wastes from manufacturing of nylon intermediates. Small quantities of nitric acid, organic acids, and salts.
2. **Date Well Permitted:** 8/28/69 **Completed:**
3. **Injection Rate:** 300 gpm
4. **Injection Pressure:** 230
5. **Total Depth of Well:** 4230
6. **Name, Age, and Depth of Injection Zone:** Catahoula, Miocene, 3920-4092
7. **Date Injection Began: (Day)** **(Month)** 06 **(Year)** 68
8. **Total Volume Injected to Date:** 490,024,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Disposal into four injection wells at the Victoria plant site. Well #1, 2, 3 and 4

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	Combined thickness 1,600'	sand, clay
Lissie	Pleistocene			sand, gravel
Goliad	Pliocene			sand
Lagarto	Miocene			clay
Oakville	Miocene	3,000	700	sand
Catahoula	Miocene	3,700	500	sand

(a)

WIC TX-28

B. **Geologic Description of Injection Unit and Other Possible Units**

	Injection Unit	Confining Bed
(1) Name	Catahoula	
(2) Depth (Ft.)	3,000	1,600
(3) Thickness (Ft.)	1,300	2,400
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1 psi/ft. est.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %	30	
(9) Permeability, millidarcies	1045 to 1560	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sand	Clays and sands

C. **Chemical Characteristics of Formation Fluids:** Specific gravity 1.052; pH 6.9; 42,200 ppm Cl; 69,000 ppm equivalent NaCl; 71,000 ppm TDS.

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	Combined thickness 1,600	extensive	clay	fresh
Lissie			extensive	sand, gravel	fresh
Goliad			extensive	sand	fresh

4. **Mineral Resources in Area:** N/A

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** Well #1, 2, 3, 4, 6, 7

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Nitric acid, organic acids, sodium salts, some chloride and metals.

2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: 50-60°C
   - E. pH: 1-4 injection pH 7.5 to 8.5

WIC TX-28

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** All equipment corrosion-resistant construction.

5. **Degradability Level and Rate:** Possible degradation of organic acids.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; minimal biological activity due to anaerobic conditions and lack of substrate.

7. **Pre-injection Waste Treatment:** Flocculation to precipitate metal precipitates, or degradation of organic materials, settling for minimum of 24 hours, filtration, and injection.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	40#	9-5/8	2011
Intermediate				
Injection	8-5/8	17# H-55	5-1/2	4230
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 9-5/8 inch casing - 913 sks of cement plus 4% gel. and 2% $CaCl_2$ and 150 sks of cement with 2% $CaCl_2$; 5-1/2 casing - 1000 sks of Pozmix "5" plus 4% gel.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Halliburton RTT packer - 3900 ft.

5. **Bottom Hole Completion:** Perforated at 3920 - 4020 ft. and 4074 - 4092 ft. (shot) gravel packed perforation 4 shots per foot.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:**

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 50 ft. diameters and 32 ft. high, covered settling tank of steel construction, lined with fiberglass reinforced epoxy resin, organic oil separation tank - 60 ft. diameter and 12 ft. high.

2. **Filters:** Two 800 sq. ft. parallel-arranged pressure leaf horizontal filters of Inconel and stainless steel construction; 3 - 250 sq. ft. porocarbon tub filters

WIC TX-28

3. **Pumps:** Precoated with diatomaceous earth. 1000 ft. head

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	335	475
6/71	230	280
6/70	190	250
1/70	185	320

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	230	365
6/71	205	250
6/70	130	170
1/70	240	350

3. **Annual Volume Injected, gal.**
A. 19 72 112,957,000 B. 19 71 137,245,000 C. 19 71 103,927,000

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Well head and annulus pressure; injection flow rate; injection flow volume

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Possible pumping of wastes to other company wells in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** As permitted - to pressure test casing at 1500 psi within a 5% variation for one hour.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Maximum surface injection pressure of 1000 psi.

Well Id. Code: TX-29

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: E.I. DuPont DeNemours and Company
P.O. Box 2626 - Victoria, Texas 77901

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 17 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 28°39'30"/96°56'15"
3. **Well Location (Legal Description):** Desideria Garcia League Survey, 3835 ft. from the NW line and 22,340 ft. from the NE line.
4. **County:** Victoria **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Aqueous wastes from manufacturing of nylon intermediates. Small quantities of nitric acid, organic acids, and salts.
2. **Date Well Permitted:** 11/30/66 **Completed:**
3. **Injection Rate:** 300 gpm
4. **Injection Pressure:** 260
5. **Total Depth of Well:** 4205
6. **Name, Age, and Depth of Injection Zone:** Catahoula, Miocene, 3915-3969 ft.
7. **Date Injection Began: (Day)** **(Month)** 06 **(Year)** 68
8. **Total Volume Injected to Date:** 482,101,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Disposal into wells #1, 2, 3, 4, 5

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	Combined thickness - 1,000 ft.	clay
Lissie	Pleistocene			sand, gravel
Goliad	Pliocene			sand
Lagarto	Miocene			clay
Oakville	Miocene	3,000	700	sand
Catahoula	Miocene	3,700	500	sand

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Oakville-Catahoula	
(2) Depth (Ft.)	3000	1600
(3) Thickness (Ft.)	1300	2400
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %	30	
(9) Permeability, millidarcies	1045 - 1560	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont-Lissie	0	1600	extensive	sand, clay	fresh
Goliad			extensive	sand	fresh

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Nitric acid, organic acids, sodium salts, some heavy metals.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** Possible degradation of organic acids

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; minimal biological activity due to anaerobic conditions and lack of substrate.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	32#/ft.	9-5/8	2013
Intermediate				
Injection	8-5/8	17#/ft.	5-1/2	4205
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 9-5/8 inch casing - 1117 sks cement - 5-1/2 inch casing - 965 sks Pozmix + 4% Gel.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforations 3915-3940 and 3955-3969 (4 shots/ft)

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
6/72	330	435
6/71	230	300
6/70	190	265
6/69	240	350

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
6/72	260	450
6/71	175	195
6/70	120	150
6/69	215	320

3. Annual Volume Injected, gal.
A. 1972 93,674,000 B. 1971 141,681,000 C. 1970 99,828,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company wells in immediate vicinity.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report

C. Restrictions of Operation Procedures: Maximum surface injection pressure of 1,000 psi.

Well Id. Code: TX-30

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN
Operating Company Name and Address: E.I. DuPont de Nemours
P.O. Box 2626 - Victor, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 18 **(Month)** 09 **(Year)** 72
2. **Latitude and Longitude:** 28°39'30"/96°56'15"
3. **Well Location (Legal Description):** 4215 ft. from the NW line and 19740 ft. from the NE line of Desideria Garcia League Survey
4. **County:** Victoria **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Aqueous waste from manufacture of nylon intermediates; small quantities of nitric acid, organic acids, and salts.
2. **Date Well Permitted:** 11/30/66 **Completed:** 1/15/69
3. **Injection Rate:** 300 gpm
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 4356
6. **Name, Age, and Depth of Injection Zone:** Oakville-Catahoula, Miocene 3000 - 4300
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Other injection wells at plant.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		sand, clay
Lissie	Pleistocene		1600	sand, gravel
Goliad	Pliocene			sand
Lagarto	Miocene			clay
Oakville	Miocene	3000	700	sand
Catahoula	Miocene	3700	500	sand

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Oakville-Catahoula	
(2) Depth (Ft.)	3000	1600
(3) Thickness (Ft.)	1300	2400
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %	30	
(9) Permeability, millidarcies	1045 - 1560	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, tuff	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay	fresh
Lissie		1600	extensive	sand, gravel	fresh
Goliad			extensive	sand	fresh

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Nitric acid, organic acids, sodium salts, and some heavy metals (Cu, Va, Ti)

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possibly corrosive from nitric and organic acids.

5. Degradability Level and Rate: Possible degradation of organic acids

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection, minimal biological activity

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		83# H-40	9-5/8	2002
Intermediate				
Injection		Stainless steel J-55	5-1/2	4356.45
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:
9-5/8" casing - 1150 sks Trinity type H + 4% gel
5-1/2" casing - 960 sks Pozmix + 4% gel

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: Parallel leaf filters

WIC TX-30

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous

2. Contingency Plan for Well Failure During Operation: Pump to other company wells

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom bole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure rates and total volume; report biannually

C. Restrictions of Operation Procedures: Maximum surface injection pressure of 1000 psi.

Well Id. Code: TX-31

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Mobile Chemical Company
P.O. Box 3868 · Beaumont, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 11 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 29°58'19"/94°03'49"
3. **Well Location (Legal Description):** William Sigler Survey, Abs. 48, 4100 ft. FWL and 5430 ft. FNL.
4. **County:** Jefferson **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Liquid consisting of acetic acid and organic salts.
2. **Date Well Permitted:** 11/30/66 **Completed:**
3. **Injection Rate:** 190,700,000 gpy
4. **Injection Pressure:** 400 - 750 psi
5. **Total Depth of Well:** 6030 ft.
6. **Name, Age, and Depth of Injection Zone:** Miocene sand, 5932-5978 ft.
7. **Date Injection Began: (Day)** **(Month)** 08 **(Year)** 67
8. **Total Volume Injected to Date:** 953,515,450 (6/72) **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Two surface pits.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	600	clay, sand
Lissie	Pleistocene	600	600	sand
Willis	Pliocene			sand, silt
Goliad	Pliocene			sand
Catahoula	Miocene	3500		sand, silt, clay

(a)

WIC TX-31

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	5930	1200
(3) Thickness (Ft.)	48	4700
(4) Formation Fluid Pressure, psi	2405	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	0.78 psi/ft	
(7) Age of Unit	Miocene	Pliocene-Miocene
(8) Porosity %	33.7	
(9) Permeability, millidarcies	3180	
(10) Reservoir Temperature, °C	52°	
(11) Character and Areal Distribution	sand, silt widespread	clay, sand widespread

C. Chemical Characteristics of Formation Fluids: Chloride ion = 37,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	600	extensive	clay, sand	fresh
Lissie	600	600	extensive	sand, gravel	fresh

4. Mineral Resources in Area: Oil and gas in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations In Immediate Hydrologically Affected Area: Spindle top oil field two miles north.

IV. WASTE CHARACTERISTICS

1. Technical Description (Excluding Radioactivity): Acetic acid = 2160 ppm; terephthalic acid = 150 ppm; xylene = 55 ppm; methyl ethyl ketone = [illegible] ppm; paratoluic acid = 65 ppm; benzoic acid = [illegible] ppm; other hydrocarbons = 26 ppm

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: n/a

B. Conc. Dissolved Solids, mg/l: 3000

C. Specific Gravity: n/a

D. Temperature: n/a

E. pH: n/a

3. Toxicity: May be toxic from acids.

4. Reactivity with Surface Equipment Components: All surface piping is stainless steel and tanks are aluminum to reduce corrosion.

5. Degradability Level and Rate: Oxidation of acids to carbon dioxide and water may occur.

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-Injection Waste Treatment: pH control, biological treatment - BOD removal, and settling.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		24# J-55	8-5/8	2521
Intermediate				
Injection		17# Type 304 ss	5-1/2	6030
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8-5/8 inch casing - 630 sks class H w/8% gel. + 100 sks Densified Incor w/0.5% CF12-2; 5-1/2 inch casing - 1900 sks Densified Incor w/1% CF12-2 + 0.2% HR-4

3. Well Head Equipment (Name and Models): Oil Center Tool Co. 4" stainless steel tree.

4. Packers, Centralizers, and Other Subsurface Equipment: Plug at 6000 ft.

5. Bottom Hole Completion: Perforations: 5932-5978 ft. with 1 5th. screen; jet cluster/ft. (4 - 0.1" diameter jets/ cluster)

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two 10,000 barrel welded aluminum holding tanks, concrete berm - 12" x 15" x 12"

2. Filters: Fixed bed anthracite filter

3. Pumps: Centrifugal

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	Maximum
Date(s)	6/68	253	282
"	6/70	257	336
"	6/71	317	360
"	6/72	129	276

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	Maximum
Date(s)	6/68	693	720
"	6/70	415	450
"	6/71	489	590
"	6/72	748	815

3. Annual Volume Injected, gal.
A. 1972 56,630,100 B. 1971 152,204,100 C. 1970 132,312,040

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Two 8 acre surface ponds.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1500 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum permitted surface injection pressure of 2000 psig.

Well Id. Code: TX-32

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Celanese Chemical Company
P.O. Box 509 - Bay City, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 28°51'45"/96°01'04"
3. Well Location (Legal Description): James Moore League, Abs No. 62
4. County: Matagorda State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant wastes.
2. Date Well Permitted: 7/3/62 Completed:
3. Injection Rate: 100,000,000 gpy
4. Injection Pressure: 00 - 700 psi
5. Total Depth of Well: 553 ft.
6. Name, Age, and Depth of Injection Zone: Tertiary, 3300 ft.
7. Date Injection Began: (Day) 26 (Month) 07 (Year) 67
8. Total Volume Injected to Date: 533,301,688 (6/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	600	clay, sand
Lissie	Pleistocene	600	700	sand, sandstone
	Pliocene	1300	2450	sandstone, clay
	Miocene	3750		sand, clay

WIC TX-32

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	3300	1300
(3) Thickness (Ft.)	253	3000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Tertiary	Tertiary
(8) Porosity %	27.2 - 35.7	
(9) Permeability, millidarcies	193 - 1389	
(10) Reservoir Temperature, °C	61° at 3491 ft.	
(11) Character and Areal Distribution	sand, sandstone widespread	shale, clay widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	600	extensive	sand, clay	fresh
Lissie	600	1300	extensive	sand	fresh

4. Mineral Resources in Area: There are some producing oil and gas wells in the vicinity of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chemical plant wastes containing - organic acids, cyclohexane, ammonia, nylon salt, nitrate and nitrite.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: 105° F
   - E. pH: 6.5 - 7.5

WIC TX-32

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Trash screening, water skimmer to remove oil, pH adjustment, coarse sand filtration, polishing filters.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		48# H-40	13-3/8	1292
Intermediate		40# J-55	9-5/8	3245
		40# J-55	4-1/2	3553
Injection		J-55	5-1/2	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Stainless steel packers on 9-5/8" casing at 3302 ft. TIW "S" packers on 9-5/8" casing at 3195 ft.

5. Bottom Hole Completion: Gravel packed and screened from 3245 to 3553 feet.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 90' x 30' x 8' contaminated water skimmer, 400 million gallon surge tank.

2. Filters: Sand filters, polish filters pre-coated with a volcanic ash filter aid.

WIC TX-32

3. Pumps: Two stage centrifugal pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	7/67	Average	207	Maximum	286
"	6/68		238		287
"	6/70		297		400
"	6/72		133		282

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	7/67	Average	162	Maximum	186
"	6/68		548		682
"	6/70		372		454
"	6/72		243		360

3. Annual Volume Injected, gal.
A. 1972 52,503,840 B. 1971 99,591,840 C. 1970 145,756,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Pressure tested at 1000 psi on all casing; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume, report biannually.

C. Restrictions of Operation Procedures: Maximum injection rate of 400 gpm and injection pressure of 1000 psig.

Well Id. Code: TX-33

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Celanese Chemical Company
P.O. Box 58009 - Houston, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 12 (Month) 09 (Year) 72
2. Latitude and Longitude: 29°37'40"/95°03'24"
3. Well Location (Legal Description): George B. McKinstry Abs. No. A-47, 10,200 ft. FEL and 2,850 ft. FSL.
4. County: Harris State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant wastes.
2. Date Well Permitted: 7/27/67 Completed:
3. Injection Rate: 190 gpm
4. Injection Pressure: 450 psi
5. Total Depth of Well: 5512 ft.
6. Name, Age, and Depth of Injection Zone: Miocene, 4600 - 5400 ft.
7. Date Injection Began: (Day) 31 (Month) 10 (Year) 67
8. Total Volume Injected to Date: 353,941,090 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		clay, sand
Altaloma	Pleistocene			sand
Lissie	Pleistocene			sand, clay
	Tertiary			sand, clay

(a)

WIC TX-33

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	5250	1450
(3) Thickness (Ft.)	300	3500
(4) Formation Fluid Pressure, psi	2276	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	0.46 psi/ft est.	
(7) Age of Unit	Miocene	Pliocene-Miocene
(8) Porosity %	31.3	
(9) Permeability, millidarcies	333	
(10) Reservoir Temperature, °C	71°	
(11) Character and Areal Distribution	sand widespread	sand, clay widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Clear Lake Oil Field is 1-1/2 miles west.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Several aldehydes and glycols, acetate, acetic acid, and methyl alcohol

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 50
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 3.2

WIC TX-33

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtration and pH adjustment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	32.75# H-40 ST&C	10-3/4	1567
Intermediate	9-7/8	23# J-55 LT&C	7	5490
Injection		Fibercast tubing	4-1/2	5201
Other		Stainless steel liner	4-1/2	5201-5450

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 650 sks Howco Lite Wate + 100 sks cement w/2% $CaCl_2$; 7 inch casing - 550 dkd Howco Lite Wate + 850 sks Mary Neal Incor mixed with 50-50 Pozmix "A"

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** TIW type S liner packer set at 5201 ft.; 10-3/4" Davis type 600 guide shoe; 10-3/4" Davis fill-up float collar type 700; 4 Bemoco type E centralizers; 7" Davis fill-up float collar type 704; 23 centralizers.

5. **Bottom Hole Completion:** Perforations: 5349-5389 ft. and 5325-5345 ft. (4 shots/ft.)

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Plate type and cartridge type filters.

WIC TX-33

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12/68	Average	189	Maximum	276
"	12/69		167		167
"	12/70		194		308
"	12/71		298		369

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12/68	Average	460	Maximum	505
"	12/69		327		425
"	12/70		450		600
"	12/71		458		507

3. Annual Volume Injected, gal.
A. 1971 103,312,320 B. 1970 113,825,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump waste to other company well.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Monitoring well; casing and bottom hole pressure tests; monitor wil and annulus pressure, rates and volume; complete chemical analysis report biannually.

C. Restrictions of Opration Procedures: Maximum surface injection pressure of 1500 psig and rate of 400 gpm.

Well Id. Code: TX-34

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: General Aniline and Film Corporation
P.O. Box 2141 - Texas City, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 72
2. Latitude and Longitude: 29°32'00"/95°07'03"
3. Well Location (Legal Description): John Lytle Survey, 2800 ft. FNL and 2060 ft. FEL.
4. County: Galveston State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous effluent from chemical manufacturing
2. Date Well Permitted: 10/16/67 Completed:
3. Injection Rate: 76,000,000 gpy
4. Injection Pressure: 430 psi
5. Total Depth of Well: 4145 ft.
6. Name, Age, and Depth of Injection Zone: Oakville, Miocene 3800-4200 ft.
7. Date Injection Began: (Day) (Month) 04 (Year) 68
8. Total Volume Injected to Date: 217,705,042 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	950	sand, clay
Lissie	Pleistocene	950	750	sand
Goliad	Pliocene	1700		sand
Lagarto	Miocene			clay
Oakville	Miocene	3800	400	sandstone

WIC TX-34

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Oakville	Lissie-Lagarto
(2) Depth (Ft.)	3800	950
(3) Thickness (Ft.)	400	2700
(4) Formation Fluid Pressure, psi	1825	
(5) Lithostatic Pressure, psi	1.0 psi/ft est	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Pleistocene-Miocene
(8) Porosity %	30	
(9) Permeability, millidarcies	23 - 1478	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, sandstone widespread	sand, clay widespread

C. Chemical Characteristics of Formation Fluids: TDS = 116,832 ppm; Cl^- = 71,000 ppm; Na = 40,430 ppm; Mg = 986 ppm; pH = 6.87

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	950	extensive	clay, sand	potable

4. Mineral Resources in Area: Two oil producing fields within 3 miles.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: GAF water well 663 ft. deep on plant site; Humble Oil and Refinery water well 1-1/2 miles west.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Primarily organics including alcohols, aldehydes and acetates; sodium hydroxide and sulfuric acid.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC TX-34

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic fixtures.

5. **Degradability Level and Rate:** Organics may be degraded chemically or biologically.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** pH control, storage for settling and filtering.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		48#	13-3/8	1043
Intermediate		H-40	9-5/8	3624
		J-55	4-1/2	3351
Injection		Stainless Steel	5-9/16	3370-4070
Other		Screen		3646-4016

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 inch casing - 520 sks cement; 9-5/8 inch casing - 717 sks cement

3. **Well Head Equipment (Name and Models):** Standard christmas tree with pressure gauges.

4. **Packers, Centralizers, and Other Subsurface Equipment:** 20 hinged centralizers, 2 positive grip stop collars in 9-5/8 inch casing, 50 pipe wipers on 13-3/8 inch casing.

5. **Bottom Hole Completion:** Gravel packed screen.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Two small agitation tanks and one storage pond lined with hypalon.

2. **Filters:** Polishing filter

3. Pumps: Centrifugal.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
6/68	10	135
" 6/69	85	120
" 6/70	155	180
" 6/72	145	182

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
6/68	135	240
" 6/69	450	500
" 6/70	425	450
" 6/71	430	500

3. Annual Volume Injected, gal.
A. 1972 38,286,640 B. 1971 65,635,402 C. 1970 56,699,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: Permitted maximum rate of 150 gpm.

Well Id. Code: TX-35

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP
Operating Company Name and Address: Phillips Petroleum Company, Cactus Plant
P.O. Box 358 - Phillips, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 72
2. Latitude and Longitude: 36°01'42"/101°58'18"
3. Well Location (Legal Description): 84.16 ft. FWL and 836.22 ft. FSL of Texas and New Orleans RR Survey, Block 2-T, Section 38
4. County: Moore State: Texas
5. SIC Classification: 2871

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from the production of ammonia, nitric acid, ammonium nitrate, and nitrogen fertilizers
2. Date Well Permitted: 2/29/68 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 4270 ft.
6. Name, Age, and Depth of Injection Zone: Council Grove, Permian 3882 ft.
7. Date Injection Began: (Day) (Month) 07 (Year) 68
8. Total Volume Injected to Date: 32,857,515 (Gallons)
9. Date Injection Ceased: (Day) 17 (Month) 09 (Year) 70
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	200	caliche, sand
Ogallala	Pliocene	200	400	sand
Red Beds	Permian	600	350	shale
Blaine	Permian	950	300	gypsum, shale
Glorietta	Permian	1250	220	sand
Clearfork	Permian	1470	230	shale, evaporites
Cimarron	Permian	1700	300	anhydrite, dolomite
Red Cove	Permian	2000	760	shale, salt, sand
Panhandle Lime	Permian	2760	340	anhydrite, dolomite
Brown	Permian	3100	740	dolomite
Neva	Permian	3740	142	limestone
Council Grove	Permian	3882		limestone, shale

(a)

WIC TX-35

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Council Grove	
(2) Depth (Ft.)	3882	600
(3) Thickness (Ft.)	400	3600
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	Permian
(8) Porosity %	8 - 16	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, shale	carbonates, shale evaporites

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	200	400	extensive	sand	fresh

4. Mineral Resources in Area: The Brown Dolomite is a gas producing formation in the area of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Gas wells surround the disposal site (21 within 2-1/2 miles), domestic and stock water wells and irrigation wells found within 2-1/2 miles.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chemical plant wastes including ammonia, nitric acid, ammonium nitrate and fluoride.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 5730
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 7.2

(b)

3. Toxicity: Possible methemoglobinemia and gastonintestinal problems due to excessive NO_3^-.

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection and bacterial activity minimized by lack of substrate and anaerobic conditions.

7. Pre-injection Waste Treatment: A flocculating agent (Dowell NP20 or Halliburton FR-8) will be added to settle out the suspended solids.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4	40.5# J-55	10-3/4	1617
Intermediate	9-7/8	20# J-55	7	4270
Injection		Fiberglass	3-1/2	3975
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - cemented to surface; 7 inch casing - cemented to 3050 ft.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforated 4220 - 3932 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Settling pond, asphalt lined, 60' x 60' x 6'

2. Filters: N/A

WIC TX-35

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-36

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Arco Chemical Company
P.O. Box 777 - Channelview, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 12 (Month) 09 (Year) 72
2. Latitude and Longitude: 29°51'05"/95°07'21"
3. Well Location (Legal Description): N/A
4. County: Harris State: Texas
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of metaxylene, 150 phthalic acid, MEK, SMA resins.
2. Date Well Permitted: 1/25/68 Completed:
3. Injection Rate: 400 gpm
4. Injection Pressure: 1000 psi
5. Total Depth of Well: 6983 ft.
6. Name, Age, and Depth of Injection Zone: Frio Sand, Eocene 4300 ft.
7. Date Injection Began: (Day) (Month) 03 (Year) 69
8. Total Volume Injected to Date: 401,167,800 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont-Lissie	Pleistocene	0	1000	sand, clay
Willis	Pliocene			sand
Goliad	Pliocene			sand, clay
Lagarto	Miocene			clay
Oakville	Miocene			sand
Catahoula	Miocene	4100	200	sand, clay
Frio	Eocene	4300	2600	sand, clay

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Frio	
(2) Depth (Ft.)	4300	3200
(3) Thickness (Ft.)	2600	1000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Eocene	Miocene
(8) Porosity %	16 - 35	
(9) Permeability, millidarcies	22 - 3400	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, clay widespread	sand, clay widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont-Lissie	0	1000	extensive	sand, clay	fresh
Willis			extensive	sand	fresh

4. Mineral Resources in Area: Oil is produced in the area in the North Channelview Oil Field located one mile southeast of the well site.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste liquid from a petrochemical plant operation containing sodium phthalate, methyl ethyl ketone, acetic acid, sulfuric acid, sodium hydroxide
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC TX-36

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive; all equipment constructed of Alloy 20 or fiberglass.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; possible anaerobic degradation of organics.

7. Pre-injection Waste Treatment: pH adjustment and storage in plastic lined pond after filtering in a metal tank, oil skimming, and addition of Sinclair 5011 to prevent calcium and barium sulfate scale.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	22	65# J-55	16	2013
Intermediate	14-3/4	45.5# J-55	10-3/4	3850
	9-3/4	29.7# N-80	7-5/8	6960
Injection		12.75# Hydril	4-1/2	6494
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: D.V. tool; Baker model "DA" packer with latch in seal assembly.

5. Bottom Hole Completion: Perforations - 64 shots @ 6756 - 6772 ft. and 40 shots @ 6865 - 6875 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Plactic lined pond (300' x 350'), metal tank (70' x 110')

2. Filters: N/A

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/69	Average	105	Maximum	430
"	6/70		204		250
"	6/71		188		485
"	6/72		295		385

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/69	Average	575	Maximum	770
"	6/70		1162		1320
"	6/71		420		930
"	6/72		810		985

3. Annual Volume Injected, gal.
A. 1971 133,967,120 B. 1970 129,287,960 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested at 1000 psi for leakage; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum operating pressure of 1300 psi.

Well Id. Code: TX-37

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: Arco Chemical Co.
P.O. Box 777, Channelview, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 09 (Year) 73
2. Latitude and Longitude: 29°51'05"/95°07'21"
3. Well Location (Legal Description): N/A
4. County: Harris State: Texas
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Manufacture of metaxylene, 150 phthalic acic, MEK, SMA
2. Date Well Permitted: 10/7/70 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC TX-37

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC TX-37

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: TX-39

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: San Patricio Municipal Water District
P.O. Drawer 5 - Ingleside, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 16 (Month) 09 (Year) 72
2. Latitude and Longitude: 27°53'30"/97°15'00"
3. Well Location (Legal Description): T.T. Williamson Survey Ab. 293, 2300 ft. from the north line and 30 ft. from the west line
4. County: San Patricio State: Texas
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wash down operation water in water treatment plant plus some excess chlorine that may spill from the chlorinator.
2. Date Well Permitted: 6/11/69 Completed:
3. Injection Rate: 50 gpd
4. Injection Pressure: gravity
5. Total Depth of Well: 20 ft.
6. Name, Age, and Depth of Injection Zone: Beaumont, Pleistocene 0 - 20 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Dune deposits	Recent	0		sand
Beaumont	Pleistocene	0		sand, clay

WIC TX-39

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Beaumont	
(2) Depth (Ft.)	0	
(3) Thickness (Ft.)	20	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pleistocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, clay	

C. Chemical Characteristics of Formation Fluids: None

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
None					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Fresh water which will occasionally contains some excess chlorine that may spill from the chlorinator.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. Toxicity: Non-toxic except when chlorine contint is transiently excessive. Probably irritating rather than toxic.

4. Reactivity with Surface Equipment Components: When chlorine is present it will corrode iron, stainless steel, aluminum, etc.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably none when the chlorine level is appreciable.

7. Pre-injection Waste Treatment: Grit basin in treatment plant to catch large material.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	24			20
Intermediate				
Injection				
Other		Perforated tubine	4	20

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: None

3. Well Head Equipment (Name and Models): None

4. Packers, Centralizers, and Other Subsurface Equipment: None

5. Bottom Hole Completion: Perforations in tubing with annulus filled with vary coarse aggregate.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Cast iron pipe to well (underground).

2. Filters: None

WIC TX-39

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: TX-40

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC
Operating Company Name and Address: Texas Eastern Trans. Co.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 12 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Chambers State: Texas
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
    A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC TX-40

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC TX-40

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC TX-40

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: ______

Well Id. Code: TX-41

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP
Operating Company Name and Address: Duvall Corporation
P.O. Box 1507 - Fort Stockton, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 16 (Month) 09 (Year) 72
2. Latitude and Longitude: 31°06'12"/102°48'10"
3. Well Location (Legal Description): GC & SF RR Survey, Abs. No. 3008, 1500 ft. FSL and 1077.8 ft. FEL of section 589.
4. County: Pecos State: Texas
5. SIC Classification: 1477

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Calcium carbonate and water slurry from water softening.
2. Date Well Permitted: 8/23/68 Completed:
3. Injection Rate: 350 - 400 gpm
4. Injection Pressure: N/A
5. Total Depth of Well: 650 ft.
6. Name, Age, and Depth of Injection Zone: Castile, Permian 425 - 650 ft.
7. Date Injection Began: (Day) (Month) 09 (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Pecos Aquifer	Cretaceous	0	112	sand, caliche, gravel
Red Beds	Permian	112	188	shale
Rustler	Permian	300	125	anhydrite, limestone
Castile	Permian	425	213	limestone, sulfur
Tansil	Permian	638	192	
Yate		830		

WIC TX-41

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Castile	Red Beds-Rustler
(2) Depth (Ft.)	425	112
(3) Thickness (Ft.)	213	313
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est	
(7) Age of Unit	Permian	Permian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone widespread	shale, anhydrite limestone widespread

C. Chemical Characteristics of Formation Fluids: Abundant sulfur compounds in solution.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	0		variable	sand, gravel	TDS = 5000 ppm
Pecos	0	112	extensive	sand, gravel	TDS = 5000 ppm
Rustler	300	125	extensive	limestone	TDS = 5000 ppm

4. Mineral Resources in Area: Sulfur deposits, oil fields: Heiner - 1/2 mile NW; Heiner South Field - 3/4 mile S; Pecos Valley field - 1-1/2 miles NE; Henderson - Pecos Field - 3 miles W.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Water is a slurry consisting of an estimated 10-20% $CaCO_3$ suspension with sulfate, sodium and chloride.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 32,900
   B. Conc. Dissolved Solids, mg/l: 5,100
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 7.9

3. Toxicity: None

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection:
Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Soda ash is mixed to precipitate dissolved calcium as calcium carbonate. Sodium sulfate is the soluble by-product. The process decreases hardness but does not lower suspended solids.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		28# J-55 T&C	8-5/8	400
Intermediate				
Injection		24# J-55 T&C	6-5/8	425
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:
8-5/8 inch casing - cemented to surface.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole completion.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-41

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-42,43

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC

Operating Company Name and Address: Petro-Tex Chemical Corp

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 09 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Harris State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC TX-42

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC TX-42

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC ______ TX-42 ______

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program
   - A. Monitoring Devices and Data: ______
   - B. Sampling Frequency and Water Quality Parameters Measured: ______
   - C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects
   - A. Construction Requirements: ______
   - B. Monitoring Requirements: ______
   - C. Restrictions of Operation Procedures: ______

Well Id. Code: TX-44

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NOUP
Operating Company Name and Address: U.S. Paroxygen Division, Argus Chemical Co
P.O. Box 458 - Marshall, Texas 75670

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 72
2. Latitude and Longitude: 32°35'48"/94°22'12"
3. Well Location (Legal Description): 2883 ft. FEL and 500 ft. FSL of J.E. Fields Survey
4. County: Harrison State: Texas
5. SIC Classification: 2841

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waster by-product of a peroxide manufacturing process.
2. Date Well Permitted: 9/30/68 Completed:
3. Injection Rate: 2,600,000 gpy
4. Injection Pressure: 800 psi
5. Total Depth of Well: 3900 ft., plugged back to 2542 ft.
6. Name, Age, and Depth of Injection Zone: Blossom, Cretaceous 2410 ft.
7. Date Injection Began: (Day) 20 (Month) 11 (Year) 68
8. Total Volume Injected to Date: 3,676,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Clairborne	Cretaceous	0		sandstone
Wilcox	Cretaceous		450	sandstone
Midway	Cretaceous	450	1000	shale
Nacatoch	Createceous			shale, sandstone
Blossom	Cretaceous	2410		sandstone
Paluxy	Cretaceous	3770		

(a)

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Nacatoch-Blossom	Midway
(2)	Depth (Ft.)	2410	450
(3)	Thickness (Ft.)		1000
(4)	Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5)	Lithostatic Pressure, psi	1.0 psi/ft est.	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7)	Age of Unit	Cretaceous	Cretaceous
(8)	Porosity %	20 - 25	
(9)	Permeability, millidarcies	1 - 100	
(10)	Reservoir Temperature, °C	40° - 62°	
(11)	Character and Areal Distribution	sand, shale	shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	387		extensive	sand	potable

4. Mineral Resources in Area: The plant is located in the Woodlawn Gas Field.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Hydrogen peroxide, organic peroxides, ketones, esters, sulfuric acid, hydrochloric acid, organic acids, sodium chloride, sodium sulfate, and alcohol
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 176,740
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-44

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive due to presence of acids, peroxides and sodium chloride.

5. Degradability Level and Rate: Possible chemical degradation and oxidation of organics.

6. Biological Level at Injection and Estimated Biological Level After Injection: Possibly sterile at injection.

7. Pre-injection Waste Treatment: Oil skimmer and clear filter.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		20# J-55	8-5/8	670
Intermediate		14# J-55	5-1/2	3922
		17# with TK-75	5-1/2	2312-2567
Injection		4.7# J-55 EUE	2	3663
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8-5/8 inch casing - 283 sks cement w/12% gel and 2% CaCl$_2$; 5-1/2 inch casing - 950 sks 50-50 Pozmix w/10# Gilsonite per sack and 1% CFR-2.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker model "AD" fiberglass Hybrid tension packer.

5. Bottom Hole Completion: Perforated at 2453 - 2494 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Polymer storage tanks (3).

2. Filters: Clear filters.

WIC TX-44

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12/69	Average	30	Maximum	30
"	12/70		30		30
"	12/71		30		30
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12/69	Average	750	Maximum	800
"	12/70		750		850
"	12/71		750		850
"					

3. Annual Volume Injected, gal.
A. 1971 2,660,000 B. 1970 1,016,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Minimum 12 hour test of all casing at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical ananlysis of wastes; monitor well head pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum operational surface injection pressure: 1500 psi (Paluxy Sand), 1000 psi (Blossom), 700 psi (Nacatoch Sand).

Well Id. Code: TX-45

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Calanese Chemical Company
P.O. Box 58009 - Houston, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 72
2. Latitude and Longitude: 29°37'40"/95°03'24"
3. Well Location (Legal Description): George B. McKinstry Survey, Abs. No. 47
4. County: Harris State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Acetaldehyde, acetic acid, chlorinated acetaldehyde, and water.
2. Date Well Permitted: 12/9/63 Completed:
3. Injection Rate: 35,000,000 gpy
4. Injection Pressure: 500 psi
5. Total Depth of Well: 5512 ft.
6. Name, Age, and Depth of Injection Zone: Miocene, 4600 - 5444 ft.
7. Date Injection Began: (Day) (Month) 06 (Year) 69
8. Total Volume Injected to Date: 468,068,859 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		clay
Altaloma	Pleistocene			sand
Lissie	Pleistocene			sand, clay
	Pliocene			sand
	Miocene			sand
Frio	Oligocene	6050	400	sand

WIC TX-45

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	5000	1450
(3) Thickness (Ft.)		3650
(4) Formation Fluid Pressure, psi	2285	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	0.464 psi/ft est.	
(7) Age of Unit	Miocene	Pliocene-Miocene
(8) Porosity %	28 - 33	
(9) Permeability, millidarcies	400 - 500	
(10) Reservoir Temperature, °C	55°	
(11) Character and Areal Distribution	sand	clay

C. Chemical Characteristics of Formation Fluids: TDS = 105,300 ppm; Cl^- = 63,000 ppm; Na = 35,200 ppm; Ca = 35,000 ppm; Mg = 930 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Clear Lake oil field is 1/2 mile west. The oil and gas from this field is produced from a salt dome.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetaldehyde, acetic acid, chlorinated acetaldehyde, glycols, acetate, methyl alcohol.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection, minimum bacterial degradation due to anaerobic environment.

7. Pre-injection Waste Treatment: pH adjustment, filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	18-5/8	54# H-40	13-3/8	1562
Intermediate	12-1/2	40.5# J-55	9-5/8	5130
	12-1/2	Carpenter 20	8-5/8	5191
Injection		Fibercast	6-5/8	5140
Other		Carpenter	4-1/2	5148-5430

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 1100 sks Howco Lite Wate w/2% $CaCl_2$; 9-5/8 inch casing - 1100 sks Pozmix A w/2% $CaCl_2$; 8-5/8 inch casing - 476 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 8-5/8" Genco centralizers @ 5180 ft. and 5150 ft.; 14 Turbilizer centralizers on 9-5/8" casing; TIW Cap 20 packer for 4-1/2" liner at 5140.65 ft.

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: Filter coated with diatomaceous earth; cartridge filter.

3. Pumps: 3 pumps.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/69	Average	121	Maximum	205
"	12/69		93		190
"	12/70		126		204
"	12/71		102		114

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/69	Average	550	Maximum	630
"	12/69		475		600
"	12/70		443		670
"	12/71		461		501

3. Annual Volume Injected, gal.
A. 1971 35,045,416 B. 1970 45,560,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company well.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of waste; monitor well head and annulus pressure, rate, and total volume; report biannually.

C. Restrictions of Operation Procedures: Operating surface injection pressures shall be limited to 1500 psig.

Well Id. Code: TX-46

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC

Operating Company Name and Address: Pan American Petroleum Corp.
P.O. Box 5038, Beaumont, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Galveston State: Texas
5. SIC Classification: 1477

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: 12/23/68 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC TX-46

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: TX-47

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Mobile Chemical Co.
P.O. Box 3865 - Beaumont, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 29°58'19"/94°03'49"
3. **Well Location (Legal Description):** William N. Sigler Survey, Abs. 48, 3570 ft. FWL and 4244 ft. FNL.
4. **County:** Jefferson **State:** Texas
5. **SIC Classification:**

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Acetic acid, terephthalic acid, xylene, methyl ethyl ketone, paratoluic acid, and other hydrocarbons.
2. **Date Well Permitted:** 1/15/69 **Completed:**
3. **Injection Rate:** 62,260,088 gpy
4. **Injection Pressure:** 750 psi
5. **Total Depth of Well:** 6218 ft.
6. **Name, Age, and Depth of Injection Zone:** Miocene sand, 5950 - 5990 ft.
7. **Date Injection Began: (Day)** 08 **(Month)** 03 **(Year)** 70
8. **Total Volume Injected to Date:** 95,792,540 (6/72) **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont-Lissie	Pleistocene	0	1000	sand, gravel, clay
Willis	Pliocene	1000		sand
Goliad	Pliocene			clay
Catahoula	Miocene	3500		sand

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Catahoula	Willis-Goliad
(2) Depth (Ft.)	3500	1000
(3) Thickness (Ft.)		2500
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Pliocene
(8) Porosity %	30	
(9) Permeability, millidarcies	500	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: Chloride = 1700-2000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	600	extensive	sand, clay	fresh
Lissie	600	400	extensive	sand, gravel	slightly saline
	2500	3500		sand, silt	saline

4. Mineral Resources in Area: Oil and gas produced in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Spindletop Oil Field is 2 miles north; Lovell Lake Oil Field is 2-1/2 miles WSW.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid = 2240 ppm; terephthalic acid = 150 ppm; xylene = 55 ppm; methyl ethyl ketone = 50 ppm; paratoluic acid = 40 ppm, benzoic acid = 20 ppm; other hydrocarbons = 24 ppm
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/1: 0
   B. Conc. Dissolved Solids, mg/1: 2000 - 3000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** The mixture would be toxic and irritating to tissue. Dilution will reduce the toxicity but not of the water-insoluble xylene.

4. **Reactivity with Surface Equipment Components:** Will be corrosive to aluminum and iron. Methyl ethyl ketone and xylene will weaken rubber.

5. **Degradability Level and Rate:** Organic materials will eventually be altered by oxidation; minimally under the subject conditions.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably sterile; paratoluic acid is a strong acid harmful to bacteria and xylene also would also kill bacteria.

7. **Pre-injection Waste Treatment:** pH adjustment, biological treatment- remove BOD, and settling.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		24# J-55	8-5/8	2535
Intermediate				
Injection		17# Stainless Steel type 304	5-1/2	6218
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 1000 sks Class H with 8% gel and 150 sks densified Incor with 1% CFR-2; 5-1/2 inch casing - 345 sks Trinity Lite Wate and 790 sks densified Incor with 2% HR-4

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Float collar - PBTD 6190 ft.; 40 centralizers on the 5-1/2 inch tubing.

5. **Bottom Hole Completion:** Perforations: 5950-5990 ft., 4 shots per foot hyper-jet (0.41 inch diameter)

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Gyp-Lignosulfonate acid mud.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2 - 1000 barrel welded aluminum holding tanks; concrete basin, 12' x 15' x 12'

2. **Filters:** Fixed bed anthracite filter.

3. **Pumps:** Centrifugal

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	Maximum
Date(s)	6/70	54	81
"	6/71	134	155
"	6/72	115	155
"			

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	Maximum
Date(s)	6/70	754	754
"	6/71	415	470
"	6/72	751	820
"			

3. Annual Volume Injected, gal.
A. 1971 46,807,832 B. 1970 25,538,734 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Two surface storage ponds

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates, and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-48

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC
Operating Company Name and Address: LTV Electrosystems, Inc.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 09 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Hunt State: Texas
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC TX-48

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC TX-48

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: TX-49

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Celanese Chemical Company
P.O. Box 509 - Bay City, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 28°51'45"/96°01'04"
3. **Well Location (Legal Description):** Matagorda Co. Texas, beginning at SW corner of James Moore League, Ab. #62.
4. **County:** Madagorda **State:** Texas
5. **SIC Classification:** 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Chemical plant wastes.
2. **Date Well Permitted:** 4/8/69 **Completed:**
3. **Injection Rate:** 103,000,000 gpy
4. **Injection Pressure:** 300 psi
5. **Total Depth of Well:** 3630
6. **Name, Age, and Depth of Injection Zone:** Miocene Sands, 3350-3570
7. **Date Injection Began: (Day)** **(Month)** 06 **(Year)** 69
8. **Total Volume Injected to Date:** 364,106,240 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) **Name**	(b) **Age**	(c) **Depth**	(d) **Thickness**	(e) **Lithologic Description**
Beaumont Clay	Pleistocene			sand and clay
Lissie	Pleistocene	Combined	1300 ft.	sand, sandstone
Tertiary Sand	Pliocene	1300		sands and clays
Tertiary Sand	Miocene	3750		sands and clays

WIC TX-49

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Tertiary sands	
(2) Depth (Ft.)	3368	1300
(3) Thickness (Ft.)	262	3000
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	Est. 3300 psi @3300 ft.	
(7) Age of Unit	Tertiary	Tertiary
(8) Porosity %	30-35%	
(9) Permeability, millidarcies	1000-1500 md	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Well developed, fine grained sand with saline water	Relative impervious shale and/or clay beds, ranging from 10-240 ft.

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	Surface	About 1250'		sand, clay	usable fresh water
Lissie					

4. Mineral Resources in Area: Oil production in the Buckeye field, 1-1/2 miles north of the well site.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Organic acids, hydrocarbons, nitric acid, nylon salt, nitrate, nitrite.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 30,000
   C. Specific Gravity: N/A
   D. Temperature: 100°F
   E. pH: 6.5-7.5

WIC TX-49

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** Possible degradation of organics through biological activity.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; biological activity minimal due to anaerobic conditions.

7. **Pre-injection Waste Treatment:** Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15"	32.75# H-40	10-3/4"	1389'
Intermediate	9-5/8"	26.4# J-55	7-5/8"	3368'
		Steel casing	5-1/2"	3316'
Injection				
Other		316 stainless steel	4-1/2"	3372'-3579'

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4" casing - 525 sks of Howco Lt. wt. + 200 sks common with 2% $CaCl_2$
7-5/8" casing - 481 sks Lone Star Incor + 200 sks Howco Lt. wt.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Centralizer - Baker Model "m"; Packer - 316 T1W Type "S" with Teflon; Pack element.

5. **Bottom Hole Completion:** Screened and gravel packed 3368-3630 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** 2 - primer filter and polishing filter; single filter system for wells WDW 14, 32 and 49.

WIC TX-49

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/72	Average	131	Maximum	206
"	6/71		136		202
"	6/69		204		238
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/72	Average	300	Maximum	370
"	6/71		288		348
"	6/69		316		330
"					

3. Annual Volume Injected, gal.
A. 1972 55,250,240 B. 1971 103,453,920 C. 1970 153,453,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Wellhead and annulus pressure: injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immed.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-50

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC
Operating Company Name and Address: Oxivane Chemical Company

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 09 (Year) 73
2. Latitude and Longitude:
3. Well Location (Legal Description):
4. County: State:
5. SIC Classification:

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected:
2. Date Well Permitted: Completed:
3. Injection Rate:
4. Injection Pressure:
5. Total Depth of Well:
6. Name, Age, and Depth of Injection Zone:
7. Date Injection Began: (Day) (Month) (Year)
8. Total Volume Injected to Date: (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal:

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

(a)

WIC TX-50

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC TX-50

3. Pumps: ____________________

VII. OPERATIONSCHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-51

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Dow Badishe Company
602 Copper Road - Freeport, Texas 77541

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 16 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 29°00'04"/95°24'09"
3. **Well Location (Legal Description):** Alexander Calvit League, Ab. 49
4. **County:** Brazoria **State:** Texas
5. **SIC Classification:** 2815

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Chemical plant wastes - aqueous solution of organic acids, alcohols, and aromatics.
2. **Date Well Permitted:** 6/9/69 **Completed:**
3. **Injection Rate:** 30,000,000 gpy
4. **Injection Pressure:** 350-800 psi
5. **Total Depth of Well:** 6220
6. **Name, Age, and Depth of Injection Zone:** Miocene sands, L. Miocene, 6000
7. **Date Injection Began: (Day)** 26 **(Month)** 04 **(Year)** 70
8. **Total Volume Injected to Date:** 81,987,814 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	300	sand, gravel, clay
Beaumont Clay	Pleistocene	300	1000	clay, sand
	Pliocene	3100	940	Interbedded sands and clays
	Miocene	4040		Interbedded sands and clays

WIC TX-51

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sands	
(2) Depth (Ft.)	6000	1300
(3) Thickness (Ft.)		4700
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Lower Miocene	Tertiary
(8) Porosity %	28-32	
(9) Permeability, millidarcies	200-1000	
(10) Reservoir Temperature, °C	83°	
(11) Character and Areal Distribution	sand and clay substantial areal extent	clays & sands

C. **Chemical Characteristics of Formation Fluids:** Non-commercial saline formation water.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Recent	0	300			
Beaumont Clay	300	1000			usable quality water

4. **Mineral Resources in Area:** Nearest production is found in the Stratton Ridge South Field located 3 miles east. Production if from the 4500-5700 ft. in depth.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** TX-59, 71,76,81,99,51 are all in the same area.

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Volume 150 gpm - 300 gpm maximum. Waste from chemical plant processes with organic acid, coprolactam, butonal, benzene, cyclohexane.
2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: 14,000
   - C. Specific Gravity: 1.061-1.087
   - D. Temperature: N/A
   - E. pH: 6.3-7.0

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** Possible biological breakdown of organics anaerobically.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; biological activity minimal due to anaerobic conditions.

7. **Pre-injection Waste Treatment:** Storage in metal tanks, filtered, and injected. pH neutralization by blending acid waste stream with an alkaline waste stream.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32.75#/ft. H-40 STC	10-3/4	1327
Intermediate		23#/ft. J-55 STC	7	6195
Injection		9.5#/ft. J-55 STC	4-1/2	6046
Other		5.5 wire liner wrapped on ribbed 4" op 11.6 lb/ft.	4	6046-6184

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 528 sks TLW + 280 sks Class H 2/2% $CaCl_2$; 7-inch casing - 345 sks TCW and 325 sks Class "E".

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 10-3/4 inch casing - 5 centralizers and 5 scratchers - 7 inch casing - 17 centralizers and 23 wipers - Baker Model "A-Z" Lok-set Packer and 4-1/2 inch casing.

5. **Bottom Hole Completion:** Gravel packed 6034-6184 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 15% HCl (1500 gal. 7/13/70; 5000 gal. 7/15/70)

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TX-51

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	76	87
" 6/71	76	97
" 12/70	63	94
" 7/70	96	147

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	541	654
" 7/71	453	714
" 12/70	367	683
" 7/70	556	795

3. **Annual Volume Injected, gal.**
A. 1972 19,562,688 B. 1971 34,476,194 C. 1970 27,921,632

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** 600x60x7 feet clay-lined pit.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi: injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report

C. **Restrictions of Operation Procedures:** Surface injection pressure maximum 2500 psig.

Well Id. Code: TX-52,53

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC

Operating Company Name and Address: Phillips Petroleum Co.
Box 391, Borger, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 73
2. Latitude and Longitude: 35°44'17"/101°18'20"
3. Well Location (Legal Description): N/A
4. County: Hutchinson State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC TX-52

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC TX-52

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program
   - A. Monitoring Devices and Data:
   - B. Sampling Frequency and Water Quality Parameters Measured:
   - C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects
   - A. Construction Requirements:
   - B. Monitoring Requirements:
   - C. Restrictions of Operation Procedures:

Well Id. Code: TX-53

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PNC
Operating Company Name and Address: Phillips Petroleum Company
P.O. Box 391 - Borger, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 09 (Year) 73
2. Latitude and Longitude: 35°44'17"/101°18'20"
3. Well Location (Legal Description): N/A
4. County: Hutchinson State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TX-53

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

WIC TX-53

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC ______ TX-53 ______

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-54

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: E.I. DuPont de Nemours Company
P.O. Box 1089 - Orange, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 16 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 30°03'26"/93°44'31"
3. **Well Location (Legal Description):** 3248 ft. west and 417 ft. north of SW corner of W.H. Starkey Survey, Ab. 505 (located in Stephen Jett Surv. Ab.16).
4. **County:** Orange **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** A dilute aqueous solution of ammonium sulfate, sulfuric acid, and trace quantities of hydrogen cyanide and organic nitriles.
2. **Date Well Permitted:** 8/7/69 **Completed:**
3. **Injection Rate:** 49,000,000 gpy
4. **Injection Pressure:** 170-650 psi
5. **Total Depth of Well:** 5000 ft.
6. **Name, Age, and Depth of Injection Zone:** Catahoula, Miocene, 4400 ft.
7. **Date Injection Began: (Day)** 28 **(Month)** 06 **(Year)** 71
8. **Total Volume Injected to Date:** 81,441,900 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Well #23

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	Combined thickness of 1000	clay and sand
Lissie	Pleistocene			sand and gravel
Willis	Pliocene			sand
Oakville	Miocene			sandstone
Catahoula	Miocene	4400		sandstone

WIC TX-54

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Catahoula	
(2) Depth (Ft.)	4400	1000
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	33.1	
(9) Permeability, millidarcies	2100	
(10) Reservoir Temperature, °C	55	
(11) Character and Areal Distribution	poorly consolidated sand	interbedded clays & sands

C. Chemical Characteristics of Formation Fluids: Brine with 1.05 Specific Gravity. Calcium in the formation may combine with sulfates in the waste water and ppt. at the interface causing a decrease in permeability.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay	1000 ppm TDS up to 720'
Lissie Fm		1000	extensive	sand,gravel	1000-3000 ppm from 720' to 1000'

4. Mineral Resources in Area: Production of oil in the area is found at approximately 7600 ft. to 8100 ft. in the Phoenix Lake Field, three miles east of the well. Orange Field is three miles west of the well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: TX-12, TX-23, TX-55, TX-56, and TX-57. All wells within 2-1/2 mile radius are either properly constructed and maintained or plugged properly.

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** A dilute aqueous solution of ammonium sulfate, sulfuric acid, and trace quantities of hydrogen cyanide and organic nitriles.
2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: 50°C
   - E. pH: 2-3

(b)

3. **Toxicity:** Possible HCN toxicity due to acidic medium.

4. **Reactivity with Surface Equipment Components:** Possible corrosion from contact with H_2SO_4.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; biological activity minimized by anaerobic conditions.

7. **Pre-injection Waste Treatment:** Pressure filtration after hold-up tanks settle solids out.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		J-55 54.5#/ft. STC	13-3/8 in.	1610 ft.
Intermediate				
Injection		J-55 50#/ft. LTC	9-5/8 in.	4884 ft.
Other		Bottom 120 ft. 9-5/8 in.	Carpenter	

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 in. casing - 1100 sks of 50/50 Pozmix + 2% Gel + 3% $CaCl_2$ + 155 saks of Class H. 9-5/8 inch casing - 1705 sks of Pozmix + 50sks of LR-11.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** TIW Packer seal unit 4820 ft., 9-5/8" x 5-1/2" TIW liner packer.

5. **Bottom Hole Completion:** Gravel packed screen and liner 4820-4987 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 5000 gal. 15% HCl + 1000 gal. HCl + 5000 gal. 3% HF.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Pressure filters pre-coated with diatomaceous earth.

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	245	250
"			
"			
"			

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	325	340
"			
"			
"			

3. **Annual Volume Injected, gal.**
A. 1972 32,259,400 B. 1971 48,775,000 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead an annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company wells in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Not to exceed 500#/day of a water solution containing 0.1% metal and 5% HCl. Surface injection pressure to be limited to 1500 psig.

Well Id. Code: TX-55

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: E.I. DuPont de Nemours and Company
P.O. Box 1089 - Orange, Texas 77630

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 16 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 30°03'26"/93°44'31"
3. **Well Location (Legal Description):** Orange Co., Tex., beginning at SW corner of W.H. Stark Surv., Ab. 505, proceed west 2842 ft. and then north 126 ft.
4. **County:** Orange **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** A dilute aqueous solution of ammonium sulfate, sulfuric acid, and trace quantities of hydrogen cyanide and organic nitriles.
2. **Date Well Permitted:** 8/7/69 **Completed:**
3. **Injection Rate:** 38,000,000 gpy
4. **Injection Pressure:** 300 psi
5. **Total Depth of Well:** 5060 ft.
6. **Name, Age, and Depth of Injection Zone:** Catahoula, Miocene, 4400
7. **Date Injection Began: (Day)** 06 **(Month)** 08 **(Year)** 71
8. **Total Volume Injected to Date:** 87,327,500 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	1000	sand and clay
Lissie	Pleistocene			sand and gravel
Willis	Pliocene			sand
Oakville	Miocene			sandstone
Catahoula	Miocene	4400		sandstone

(a)

WIC TX-55

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Catahoula	
(2) Depth (Ft.)	4400 ft.	1000
(3) Thickness (Ft.)		3400
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Miocene	
(8) Porosity %	33.1	
(9) Permeability, millidarcies	2109	
(10) Reservoir Temperature, °C	55	
(11) Character and Areal Distribution	Poorly consolidated sandstone	sand, gravel

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	900 ft.			1000 ppm TDS up to 720'
Lissie					1000-3000 ppm up to 1000'

These two formations are sometimes referred to as the Gulf Coast aquifer. At the well site, only to 400 ft. thick section contains fresh water with 3000 ppm TDS.

4. Mineral Resources in Area: Nearby oil production in the Phoenix Lake Field, 3 miles east. Orange Field is 3 miles west of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: TX-12, TX-23, TX-54, TX-56 with 2-1/2 mile radius.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: N/A
B. Conc. Dissolved Solids, mg/l: N/A
C. Specific Gravity: N/A
D. Temperature: 50°C
E. pH: 2-3

WIC TX-55

3. **Toxicity:** HCN toxicity due to acidic medium.

4. **Reactivity with Surface Equipment Components:** Possible corrosion from H_2SO_4

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; biological activity minimized by anaerobic conditions.

7. **Pre-injection Waste Treatment:** Pressure filtration after hold-up tanks settle solids.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		54.5 #/ft. J-55 STC	13-3/8	1616
Intermediate		40#/ft. J-55 LTC	9-5/8	4882
Injection				
Other	Bottom 120 ft.	of casing is made up of	carpenter casing.	

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 inch casing - 1345 sks of Pozmix + 155 sks common + 2% Gel + 3% $CaCl_2$; 9-5/8 inch casing - 1595 sks of Pozmix + sks of LR-11 + 3/4% of CFR-2;

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 7 S-3 Centralizers on 13-3/8 inch casing; 26 S-3 Centralizers on 9-5/8 inch casing.

5. **Bottom Hole Completion:** Gravel packed screen and liner 4820-4881 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Pre-coated with diatomaceous earth.

WIC TX-55

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	6/72	**Average**	420	**Maximum**	445
"	12/71		156		288
"	8/71		235		461
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	6/72	**Average**	350	**Maximum**	490
"	12/71		267		330
"	8/71		302		550
"					

3. **Annual Volume Injected, gal.**
A. 19 72 43,945,500 B. 19 71 37,982,000 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company wells in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure, annulus and well head pressure, rate and volume, report 5% deviation.

C. **Restrictions of Operation Procedures:** Injection pressure limited to 1500 psig.

Well Id. Code: TX-56

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: E.I. DuPont de Nemours Company
P.O. Box 1089 - Orange, Texas 77630

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 30°03'26"/93°44'31"
3. **Well Location (Legal Description):** Orange Co., Tex., beginning at SW corner of W.H. Stark Surv., Ab. 505, proceed west 3095 ft.
4. **County:** Orange **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** A dilute aqueous solution of ammonium sulfate, sulfuric acid, and traces of hydrogen cyanide and organic nitriles.
2. **Date Well Permitted:** 8/7/69 **Completed:**
3. **Injection Rate:** 400,000 gpy
4. **Injection Pressure:** 1000 psi
5. **Total Depth of Well:** 4762
6. **Name, Age, and Depth of Injection Zone:** Catahoula, Miocene, 4400 ft.
7. **Date Injection Began: (Day)** **(Month)** 10 **(Year)** 71
8. **Total Volume Injected to Date:** 1,466,906 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	surface	Combined thick-	sand and clay
Lissie	Pleistocene		ness 1000	sand and gravel
Willis	Pliocene			sand
Oakville	Miocene			sandstone
Catahoula	Miocene	4400		sandstone

(a)

WIC TX-56

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Catahoula	
(2) Depth (Ft.)	4400	1000
(3) Thickness (Ft.)		3400
(4) Formation Fluid Pressure, psi	Est. .45 psi/ft.	
(5) Lithostatic Pressure, psi	Est. 1.0 psi/ft.	
(6) Hydrofracturing Pressure, psi	Est. 1.0 psi/ft.	
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	33	
(9) Permeability, millidarcies	2109	
(10) Reservoir Temperature, °C	55	
(11) Character and Areal Distribution	poorly consolidated sand	Clays and sands

C. **Chemical Characteristics of Formation Fluids:** Brine

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont Clay		Combined thickness 1000 ft.			1000 ppm TDS to 720'
Lissie					1000-3000 ppm - 720' to 1000'

4. **Mineral Resources in Area:** Nearby production of oil is at 7600' to 8100' in the Phoenix Lake Field 3 miles east. The Orange Field is 3 miles west of well.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** Injection wells TX-12, TX-23, TX-54 TX-55 within 2-1/2 miles.

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** N/A

2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: 50°C
   - E. pH: 2-3

3. **Toxicity:** HCN toxicity due to acidic medium

4. **Reactivity with Surface Equipment Components:** Possible corrosion from H_2SO_4.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimized by anaerobic conditions.

7. **Pre-injection Waste Treatment:** Settling, filter.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			9-5/8"	1600 ft.
Intermediate		17#/ft. J-55 LTC	5-1/2"	4627 ft.
Injection		Bottom 120 ft. - 5-1/2" carpenter metal casing.		
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 5-1/2 inch casing - 1385 sks of Pozmix + 30 sks of LR-11 + 3/4% of CFR2.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 28 S-3 Centralizers on 5-1/2 inch; D.V. Tool at 3638 ft.

5. **Bottom Hole Completion:** Gravel packed with a slotted liner.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TX-56

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	7	12
10/71	5	16

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
6/72	950	1375

3. **Annual Volume Injected, gal.**

A. 19 72 1,466,906 B. 19 71 407,500 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company wells in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Maximum surface pressure 1500 psig for injection.

Well Id. Code: TX-57

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: E.I. DuPont DeNemours and Company
P.O. Box 1089 - Orange, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 30°03'26"/93°44'31"
3. **Well Location (Legal Description):** Located at a point in the Stephen Jett Survey, A-15.
4. **County:** Orange **State:** Texas
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** A dilute aqueous solution of ammonium sufate, sulfuric acid, and trace quantities of hydrogen cyanide and organic nitriles.
2. **Date Well Permitted:** 8/7/69 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 4750
6. **Name, Age, and Depth of Injection Zone:** Miocene Sands, 4300-50000
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	1000 combined	clay, sand
Lissic	Pleistocene			sand, gravel
Willis	Pliocene			sand
Oakville	Miocene			sandstone
Catahoula	Miocene	4400		

WIC TX-57

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Catahoula	
(2) Depth (Ft.)	4750	1000
(3) Thickness (Ft.)	250	3400
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	33.1	
(9) Permeability, millidarcies	2109	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	clay, sand

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		exten.	clay	1000 ppm TDS to 720'
Lissie		1000	exten.	sand, gravel	1000-3000 ppm from 720' to 1000'

4. Mineral Resources in Area: Production of oil from 7600 ft.-8100 ft. in the Phoenix Lake Field, three miles east of the well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: TX-12, TX-23, TX-54, TX-55, TX-56, with 2-1/2 miles.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Mixed organic nitriles 90%, organic nickel and phosphorous compounds 10%, appearance - clear, dark brown.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 50°C
   E. pH: N/A

WIC TX-57

3. **Toxicity:** N/A
a

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal due to anaerobic conditions.

7. **Pre-injection Waste Treatment:** Boiling wastes from the manufacturing operation will be mixed with another distillate waste stream to control viscosity. The mixture is sent to a hold-up tank where it is pressure filtered and injected.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		H-40 32.31#/ft.	9-5/8	1637
Intermediate	8-5/8"	J-55 171#/ft.	5-1/2	4630
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 1000 sacks of 50/50 Pozmix + 2% Gel + 3% $CaCl_2$ + 155 sacks of class A common to surface. 235 sacks of common and 30 sacks of LR-11; 1400 sacks of Pozmix + 5% gilsonite.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 7 centralizers on the 9-5/8 inch casing; 28 centralizers on the 5-1/2 inch casing.

5. **Bottom Hole Completion:** Open hole completion.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Pressure filter

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		Average		Maximum	
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)		Average		Maximum	
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company wells in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immed.

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: TX-58

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN
Operating Company Name and Address: Celanese Chemical Co.
P.O. Box 428 - Bishop, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 27°34'25"/97°50'23"
3. Well Location (Legal Description): Section 149, F.Z. Bishop subdivision of the Weil Ranch in Mathis Garcia Survey.
4. County: Nueces State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous effluent from petrochemical manufacturing
2. Date Well Permitted: 08/18/69 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 4720 ft.
6. Name, Age, and Depth of Injection Zone: Anahuac, Oligocene 4000 - 4650 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	300	clay, sand
Lissie	Pleistocene	300	900	sand, clay
Goliad	Pliocene	1200	600	sand
Largarto	Miocene	1800		clay
Oakville	Miocene			sandstone
Catahoula	Miocene			tuff, clay
Anahuac	Oligocene	4000	250	sand

(a)

WIC TX-58

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Anahuac	
(2) Depth (Ft.)	4000	
(3) Thickness (Ft.)	250	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Oligocene	
(8) Porosity %	24	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		variable	sand,clay	fresh
Lissie	600	300	extensive	sand,clay	fresh
Goliad	900	100	extensive	sand	fresh

4. Mineral Resources in Area: Oil and gas in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: City of Bishop water wells; Humble Oil and Refining Co. have nine water wells 9000 ft. SW.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium formate - 400,000 ppm organic acids, aldehydes

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

(b)

WIC TX-58

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal

7. Pre-injection Waste Treatment: Oil skimmer, emergency storage pond, toxic materials monitoring pond, an equalization pond, nutrient addition facilities, two aeration basins, a clarifier, a sludge digestor, and a cooling tower.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		40.5# H-40	10-3/4	1550
Intermediate		20# J-55	7	4250
		Schedule 40 stainless	6-5/8	4250-4650
Injection		11.6# J-55	4-1/2	4300
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4" casing - cemented to surface; 7" casing - cemented to surface; 6-5/8" casing - cemented to surface

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer set at 4300 ft.

5. Bottom Hole Completion: Sand perforated 4550 - 4650 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-58

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__. ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-59

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Dow Chemical Company
P.O. Box Drawer K - Freeport, Texas 75541

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 28°59'41"/95°23'54"
3. **Well Location (Legal Description):** 10467.01 feet southerly along west line from NW corner of Alexander Calvit League, Ab. 49.
4. **County:** Brazoria **State:** Texas
5. **SIC Classification:** 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Organic and inorganic fluid waste from the manufacture of glycerine.
2. **Date Well Permitted:** 8/21/69 **Completed:**
3. **Injection Rate:** 500,000,000 gpy
4. **Injection Pressure:** 595
5. **Total Depth of Well:** 6215 plugged back to 5864
6. **Name, Age, and Depth of Injection Zone:** Miocene sands, L. Miocene 5780
7. **Date Injection Began: (Day)** **(Month)** 07 **(Year)** 70
8. **Total Volume Injected to Date:** 1,377,754,997 (7/72) **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	310	
Beaumont	Pleistocene	310	1000	clay, sand
	Pliocene	3100	950	sands, clay
	Miocene	4050	1050	sands, clay
	Lower Miocene	5050	250	sands, clay

WIC TX-59

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sands	
(2) Depth (Ft.)	5800	1300
(3) Thickness (Ft.)		4500
(4) Formation Fluid Pressure, psi	2850 (at 6100 ft)	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	0.85 psi/ft.	
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	28-32	
(9) Permeability, millidarcies	200-1000	
(10) Reservoir Temperature, °C	31° (at 6100 ft)	
(11) Character and Areal Distribution	Unconsolidated sand with a large areal extent	clays and sands

C. **Chemical Characteristics of Formation Fluids:** Saline

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	Recent	0	300	TDS-1000 ppm	Public use
Beaumont	Pleistocene	300	950	TDS-1000-3000 ppm	Public use

4. **Mineral Resources in Area:** The nearest petroleum production is at a depth 4500-5700 ft. in the Stratton Ridge, South Field, 3-1/2 miles east of disposal well.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** Stratton Ridge, South Field, 3-1/2 miles east; TX-59, TX-71, TX-81 are all on the same company plant location.

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Volume 1250 gpm glycerine, tetrachlorohexene, ethers, sodium hydroxide, sodium chloride and sodium carbonate

2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.026 (at 175°F)
   - D. Temperature: N/A
   - E. pH: 11.7 (at 77°F)

(b)

3. **Toxicity:** Possible toxicity from high NaCl concentration - toxic ingestion improbable due to taste effect.

4. **Reactivity with Surface Equipment Components:** Metal fixtures corroded by high salt concentration, also strong NaOH corrodes aluminum.

5. **Degradability Level and Rate:** Possible chemical breakdown of organics in strong NaOH.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, possible breakdown of organics under anaerobic conditions.

7. **Pre-injection Waste Treatment:** Sedimentation, filtration, and the addition of anhydrous hydrochloric acid to reduce the pH to 7.0.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	H-40 48#/ft.	13-3/8	1,355
Intermediate	12-1/4	N-800 40#/ft.	9-5/8	5,778
Injection		K-55 23#/ft.	7	5,676
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 inch casing - 575 sks Trinity Lite Wate + 365 sks Lone Star Class "A" plus 2% Ca Cl_2. 9-5/8 inch casing - 635 sks TLW + 370 sks Texacore E then 550 sks sacks TLW.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** BOT hydraulic set Huskey H-1 Packer set at 5677.89 ft.

5. **Bottom Hole Completion:** Ribbed screen 5778-5864 ft. with S.S. wire.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidization: 5788-5864 ft.; 475 bbl. of 15% HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** A surge tank is used to hold the fluid and control the rate of flow to the injection pumps.

2. **Filters:** N/A

WIC TX-59

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/72	Average	1119	Maximum	1250
"	7/71		1219		1250
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/72	Average	595	Maximum	630
"	7/71		510		640
"					

3. Annual Volume Injected, gal.

A. 1972 295,986,000 B. 1971 533,309,000 C. 1970 158,131,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Wellhead an annulus pressure; injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company well (WDW-81) in immediate vicinity.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead an annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. Restrictions of Operation Procedures: Surface injection pressure 2500 psig max.

Well Id. Code: TX-60

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN
Operating Company Name and Address: DuVal Corporation
P.O. Box 1512 - Pecos, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 72
2. Latitude and Longitude: 31°40'/104°50'
3. Well Location (Legal Description): 1262 ft. north along the west line of section 19, Block 111, PSL Survey then 1300 ft. east
4. County: Culberson State: Texas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfur mining plant bleed water from the Rustler Formation.
2. Date Well Permitted: 8/25/69 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 2948 ft.
6. Name, Age, and Depth of Injection Zone: Cherry Canyon, Permian 2700 - 2725 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	70	sand, gravel
Rustler	Permian	70	525	limestone, dolomite
Ochoa	Permian	595	282	anhydrite
Castile	Permian	880	1200	anhydrite, limestone
Delaware	Permian	2080	860	sandstone, shale
Cherry Canyon	Permian	2700	25	quartzite sand

(a)

WIC TX-60

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Cherry Canyon	
(2) Depth (Ft.)	2700	
(3) Thickness (Ft.)	25	
(4) Formation Fluid Pressure, psi	1455	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	
(8) Porosity %	25	
(9) Permeability, millidarcies	5000	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Quartzite sand	

C. Chemical Characteristics of Formation Fluids: Brine: TDS - 25,000 ppm. Chloride - 15,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	0	70	variable	sand, gravel	poor
Rustler	70	525	extensive	sand, limestone	saline

4. Mineral Resources in Area: Sulfur mining, oil and gas drilling.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Saline water with high sulfates.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 33,500
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal

7. Pre-injection Waste Treatment: Sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8-5/8	705
Intermediate			7	825
Injection			5-1/2	2100
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8-5/8" casing - 150 sks cement to surface; 7" casing - 140 sks cement; 5-1/2" casing - cemented from 1700 - 2100 ft.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 440 ft. x 440 ft x 15 ft. sedimentation basin.

2. Filters: N/A

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-61

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: DuVal Corporation
P.O. Box 1512 - Pecos, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 31°41'35"/104°08'19"
3. **Well Location (Legal Description):** 660 ft. south of the north line and 660 ft. east of the west line of Sec 2, Black III, PSL Survey
4. **County:** Culberson **State:** Texas
5. **SIC Classification:** 1321

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Sulfur mining plant bleed water (Frasch process).
2. **Date Well Permitted:** N/A **Completed:**
3. **Injection Rate:** 1000 gpm
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 3000 ft.
6. **Name, Age, and Depth of Injection Zone:** Castile-Cherry Canyon, Permian 970-1000 and 2100-3000 ft.
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	70	sand, gravel
Rustler	Permian	70	525	limestone, dolomite
Ochoa	Permian	595	282	anhydrite
Castile	Permian	880	1200	anhydrite, limestone
Deleware	Permian	2080	860	sandstone, shale
Cherry Canyon	Permian	2700	25	quartzite sand

WIC TX-61

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Castile-Cherry Canyon	
(2) Depth (Ft.)	970 2100	
(3) Thickness (Ft.)	30 900	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Permian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, sand	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	0	70	variable	sand, gravel	poor
Rustler	70	525	extensive	sand, limestone	saline

4. Mineral Resources in Area: Sulfur mining, oil and gas fields

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Saline waste water with high sulfides.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 34,000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-61

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion due to salts.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			22	150
Intermediate			16	730
			9-5/8	2191
Injection			7	2189
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16" casing - 500 sks cement; 9-5/8" casing - 250 sks cement.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 440 ft x 440 ft x 15 ft. sedimentation basin

2. Filters: N/A

WIC TX-61

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuously

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum permitted surface injection pressure at 1000 psi.

Well Id. Code: TX-63

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: DuVal Corporation
P.O. Box 1512 - Pecos, Texas 79772

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 31°40'07"/104°13'12"
3. Well Location (Legal Description): 1000 ft. south of north line and 2050 ft. east of west line, Section 15, Block 11, PSL Survey.
4. County: Culberson State: Texas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfur mining plant bleed water.
2. Date Well Permitted: 8/25/69 Completed:
3. Injection Rate: 200,000,000 gpy
4. Injection Pressure: 70 psi
5. Total Depth of Well: 1700
6. Name, Age, and Depth of Injection Zone: Castile, Permian, 1175
7. Date Injection Began: (Day) (Month) 06 (Year) 70
8. Total Volume Injected to Date: 204,031,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	70	sand, gravel
Rustler	Permian	70	525	limestone, dolomite
Ochoa	Permian	595	282	anhydrite
Castile	Permian	880	1200	anhydrite, limestone

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Castile	Ochoa
(2) Depth (Ft.)	1175	600
(3) Thickness (Ft.)	525	300
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Permian	Permian
(8) Porosity %	25	
(9) Permeability, millidarcies	5000	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Limestone, anhydrite	Anhydrite

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	0	70	variable	sand, gravel	poor
Rustler	70	525	extensive	sand, limestone	saline

4. Mineral Resources in Area: Sulfur, oil, gas.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Volume - 1000 gpm, highly saline with sulfate

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 34,000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, no biological activity due to lack of substrate and anaerobic conditions.

7. **Pre-injection Waste Treatment:** Sedimentation.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			16	185
Intermediate			9-5/8	931
Injection			7	1175
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16-inch casing - 175 sks Pozmix + 2% $CaCl_2$ - to surface, 9-5/8 inch casing - 700 sks Pozmix + 2% $CaCl_2$ to 150 ft., 7 inch casing - 475 sks Pozmix + 4% $CaCl_2$.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** N/A

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 440 ft. x 440 ft. x 15 ft. sedimentation tank.

2. **Filters:** N/A

WIC TX-63

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	11/71	Average	250	Maximum	250
"	6/71		1100		1200
"	6/70		1200		1400
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	11/71	Average	70	Maximum	90
"	6/71		105		105
"	6/70		125		150
"					

3. Annual Volume Injected, gal.

A. 1971 183,541,000 B. 1970 20,490,000 C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. **Monitoring Devices and Data:** Wellhead an annulus pressure; injection flow rate; injection flow volume

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. Regulatory Aspects

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume.

C. **Restrictions of Operation Procedures:** Surface injection pressure 300 psig.

Well Id. Code: TX-64

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: DuVal Corporation
P.O. Box 1507 - Fort Stockton, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data:** (Day) 01 (Month) 09 (Year) 72
2. **Latitude and Longitude:** 30°55'16"/102°59'30"
3. **Well Location (Legal Description):** 126.4 ft. north of the south line and 154 ft. east of the west line Sec. 589,G.C.&S.F.R.R. Survey, Ab. 3008
4. **County:** Pecos **State:** Texas
5. **SIC Classification:** 1321

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Sulfur mining (Frasch process) - bleed water from the Salado Formation.
2. **Date Well Permitted:** 8/28/69 **Completed:**
3. **Injection Rate:** 18,000 gpm
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 2200 ft.
6. **Name, Age, and Depth of Injection Zone:** Grayburg - San Andreas, Permian 1590 ft.
7. **Date Injection Began:** (Day) N/A (Month) (Year)
8. **Total Volume Injected to Date:** N/A (Gallons)
9. **Date Injection Ceased:** (Day) (Month) (Year)
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	60	sand, gravel
Comanche	Cretaceous	60	140	limestone
Rustler	Permian	200	110	sandstone
Salado (Castile)	Permian	310	300	
Tansill	Permian	610	150	
Yates	Permian	760	830	
Grayburg	Permian	1590	160	limestone
San Andreas	Permian	1750	450	limestone

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Grayburg-San Andreas	
(2) Depth (Ft.)	1590	60
(3) Thickness (Ft.)	610	1500
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	Perm. - Cret.
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	carbonates, sandstone evaporites

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Production of oil and gas in the area is found at depths of 4900 - 5600 ft. in the Heiner field.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Heiner field located 1-1/2 miles from the injection well.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): High sulfide brines.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-64

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			16	305
Intermediate				
Injection			11-3/4	1630
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16" casing - 350 sks cement; 11-3/4" casing - 150 sks cement

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-64

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-65

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN
Operating Company Name and Address: DuVal Corporation
P.O. Box 1507 - Fort Stockton, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 30°55'16"/102°59'30"
3. Well Location (Legal Description): 2540.7' east of the west line and 299.2' south of the north line of Sec 16, Block 105, G.C. & S.F.R.R. Survey
4. County: Pecos State: Texas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfur mining (Frasch process) - bleed water from the Salado Formation.
2. Date Well Permitted: 8/28/69 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 2850 ft.
6. Name, Age, and Depth of Injection Zone: Grayburg - San Andreas, Permian 1590 ft.
7. Date Injection Began: (Day) N/ (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	60	Sand, gravel
Comanche	Cretaceous	60	140	limestone
Rustler	Permian	200	110	sandstone
Salado (Castile)	Permian	310	300	
Tansill	Permian	610	150	
Yates	Permian	760	830	
Grayburg	Permian	1590	160	limestone
San Andreas	Permian	1750		limestone

(a)

WIC TX-65

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Grayburg-San Andres	
(2) Depth (Ft.)	1590	60
(3) Thickness (Ft.)	610	1500
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	Cret. - Perm.
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Limestone	Carbonates, sandstone, evaporites

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas production.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Oil and gas field 1-1/2 miles away.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): High sulfide brine.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			13-3/8	410
Intermediate				
Injection			8-5/8	1655
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole - 1650 to 2820 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-65

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________

2. Contingency Plan for Well Failure During Operation: ____________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: TX-66

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: DuVal Corporation
P.O. Box 1507 - Fort Stockton, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 09 **(Year)** 72
2. **Latitude and Longitude:** 30°55'16"/102°59'30"
3. **Well Location (Legal Description):** 2151.3' north of the south line and 664' east of the west line of Sec 589, G.C. & S.F.R.R. Survey, Ab. 3008
4. **County:** Pecos **State:** Texas
5. **SIC Classification:** 1321

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Sulfur mining (Frasch process) - bleed water from the Salado Formation.
2. **Date Well Permitted:** 8/28/69 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 2500 ft.
6. **Name, Age, and Depth of Injection Zone:** Grayburg - San Andreas, Permian 1590 ft.
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	60	sand, gravel
Comanche Peak	Cretaceous	60	140	limestone
Rustler	Permian	200	110	sandstone
Salado (Castile)	Permian	310	300	
Tansill	Permian	610	150	
Yates	Permian	760	830	
Grayburg	Permian	1590	160	limestone
San Andreas	Permian	1750	450	limestone

WIC TX-66

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Grayburg-San Andreas	
(2) Depth (Ft.)	1590	60
(3) Thickness (Ft.)	610	1500
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ ft est.	
(7) Age of Unit	Permian	Cret. - Perm.
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	carbonates, sandstone, and evaporites

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas production 1-1/2 miles away.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Oil wells

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): High sulfide brine.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			16	410.57
Intermediate				
Injection			11-3/4	1553
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16" casing - 4000 sks cement to surface; 11-3/4" casing - 275 sks cement.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole - 1553 to 2500 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-67

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Phillips Petroleum Company
P.O. Box 391 - Borger, Texas 79007

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 09 **(Year)** 72
2. **Latitude and Longitude:** 35°44'17"/101°18'20"
3. **Well Location (Legal Description):** 6714 ft. north of south line and 1177 ft. east of west line of Sec. 70, Block 46, H&TC Surv, Hutchinson County, Texas.
4. **County:** Hutchinson **State:** Texas
5. **SIC Classification:** 2814

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Waste fluid from a butadiene plant.
2. **Date Well Permitted:** 12/2/69 **Completed:**
3. **Injection Rate:** 160,000,000 gpy
4. **Injection Pressure:** Vacuum
5. **Total Depth of Well:** 5075
6. **Name, Age, and Depth of Injection Zone:** Granite Wash., Permian, 3800
7. **Date Injection Began: (Day)** **(Month)** 12 **(Year)** 69
8. **Total Volume Injected to Date:** 245,125,332 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Ogallala	Tertiary	0	175	
Blaine	Permian	175	50	gypsum
Clear Fork	Permian	225	225	red shale
	Permian	450	150	salt
	Permian	600	1280	shale, salt
	Permian	1880	470	anhydrite
Brown	Permian	2350	260	anhydrite, dolomite
Moore Co.	Permian	2610	230	limestone
Arkosic Lime	Permian	2840	1000	limestone
Granite Wash	Permian	3840	1200	arkosic sandstone

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Granite Wash	Blaine-Arkosic Lime
(2) Depth (Ft.)	3800	175
(3) Thickness (Ft.)	1200	3600
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Permian	Permian
(8) Porosity %	high	
(9) Permeability, millidarcies	high	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	arkosic sandstone	carbonates, evaporites and shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	0	175	regional aquifer	sandstone and conglomerate	fresh water with a high concentration of TDS

4. Mineral Resources in Area: There are numerous oil and gas wells reported in the area. All producing or abandoned wells are suitably protected from any communication with the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 2500 ppm hydrocarbons (ketone, acrolein, aldehyde, alcohol) saline.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 441,600
   C. Specific Gravity: 1.3
   D. Temperature: N/A
   E. pH: 7.3

3. **Toxicity:** Possible toxicity from high NaCl concentration alleviated by repelling effect of taste; possible toxicity of acrolein.

4. **Reactivity with Surface Equipment Components:** Corrosion due to concentrated NaCl similar to seawater.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, possible bacterial degradation of organics in anaerobic environment with oxygen from organics, SO_4, HCO_3, and CO_3

7. **Pre-Injection Waste Treatment:** Pressure filter system.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	J-55 75#/ft.	16	700
Intermediate	14-3/4	J-55 45#/ft.	10-3/4	5074
Injection		J-55 20#/ft.	6-5/8	3805
Other		internally plastic coated		

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 1st stage - 660 sks of Incor + 1 lb. of latex/sack + 10% NaCl - 2nd stage - 625 sks of Class H + 20% Diaceld and 2% $CaCl_2$.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker Model 190 - DA-75 at 3797 ft.

5. **Bottom Hole Completion:** Perforated completion with 1864 holes from 3843 ft. to 4971 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Pressure filter.

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
4/72	434	882
4/71	273	450
7/70	152	180

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
4/72	-7	28
4/71	-5	0
7/70	-7	0

3. Annual Volume Injected, gal.
A. 1972 80,558,000 B. 1971 124,952,950 C. 1970 35,083,432

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company well (WDW-68) in immediate vicinity.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immed.

C. Restrictions of Operation Procedures: Operational surface injection pressure maximum - 1250 psig.

Well Id. Code: TX-68

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Phillips Petroleum Company
P.O. Box 358 - Barger, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 35°44'17"/101°18'20:
3. **Well Location (Legal Description):** 7003 ft. from the south line and 143 ft. from west line of Sec. 70, Block 46, H&TC Surv., Hutchinson County, Texas
4. **County:** Hutchinson **State:** Texas
5. **SIC Classification:** 2814

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Waste fluid from butadiene plant.
2. **Date Well Permitted:** 12/2/69 **Completed:**
3. **Injection Rate:** 300,000,000 gpy
4. **Injection Pressure:** Vacuum
5. **Total Depth of Well:** 5,074
6. **Name, Age, and Depth of Injection Zone:** Granite Wash, Permian, 3800
7. **Date Injection Began: (Day)** 28 **(Month)** 05 **(Year)** 70
8. **Total Volume Injected to Date:** 683,131,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Hill Creek-discharge site.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	185	Loose detrital material
Blaine	Permian	185	45	White gypsum
Clear Fork	Permian	230	230	Red shale
	Permian	460	160	Salt
	Permian	620	690	Red shale, salt
	Permian	1310	300	Salt with shale stringers
	Permian	1610	265	Red shale
Panhandle lime	Permian	1875	470	Anhydrite with shale
Brown Dolomite	Permian	2345	260	Anhydrite, dolomite
Moore County Lime	Permian	2605	245	Fine med. crystalline lime
Arkosic Lime	Permian	2850	1000	Lime w/some arkosic
Granite Wash	Permian	3850	225 (TD)	Pink detrital material

WIC TX-68

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Granite Wash	Blaine-Arkosic lime
(2) Depth (Ft.)	3800	175
(3) Thickness (Ft.)	1200	3600
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Permian	Permian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	arkosic sandstone	carbonates, evaporites shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	0	175	regional	sandstone conglomerate	fresh water high TDS

4. Mineral Resources in Area: Oil and gas.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 2,500 hydrocarbons (ketones, acrolein, aldehydes, alcohol) sodium chloride.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 331,000
   C. Specific Gravity: 1.2
   D. Temperature: N/A
   E. pH: 7.3

WIC TX-68

3. **Toxicity:** Possible toxicity from high NaCl concentration - ingestion improbable due to taste effect; acrolein toxic.

4. **Reactivity with Surface Equipment Components:** Corrosion due to high NaCl concentration.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, possible bacterial degradation of organics in anaerobic environment with oxygen from organics, SO_4, HCO_3 and CO_3

7. **Pre-injection Waste Treatment:** Pressure filter system.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	75# J-55	16	720
Intermediate	14-3/4		10-3/4	3074
Injection		dual lined tubing 20# J-55	6-5/8	3780
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16 inch casing - 865 sks Incor + 2% $CaCl_2$; 10-3/4 inch casing - 1st stage - 680 sks Incor + 10% NaCl and 1 lb. powdered latex per sack; 2nd stage - 625 sks of Class H + 2% $CaCl_2$.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker model "KB" Packer.

5. **Bottom Hole Completion:** Perforated 3858-3969.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 2100 gal. of 15% HCl & 7200 gal. of mud acid.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TX-68

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	834	975
"	7/71	748	950
"	10/71	463	523
"	7/70	610	720

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	-7	0
"	7/71	0	116
"	10/71	-5	0
"	7/70	6	74

3. **Annual Volume Injected, gal.**
A. 1972 145,600,000 B. 1971 320,356,250 C. 1970 213,253,430

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump to other company well (WDW-67) in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates, and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Maximum surface injection pressure 1250 psig.

Well Id. Code: TX-69

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Celanese Chemical Company
P.O. Box 58009 - Houston, Texas 77058

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 12 (Month) 09 (Year) 72
2. Latitude and Longitude: 29°37'40"/95°03'24"
3. Well Location (Legal Description): George B. McKinstry Harris Co., Texas, Abs. A-47.
4. County: Harris State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: 0.2% acetaldehyde, 1.3% acetic acid, 1.9% chlorinated acetaldehydes, and 96.6% water.
2. Date Well Permitted: 7/27/67 Completed:
3. Injection Rate: 250 gpm
4. Injection Pressure: 450 psi
5. Total Depth of Well: 5,512
6. Name, Age, and Depth of Injection Zone: Miocene Sands, 4,500-5,400 ft.
7. Date Injection Began: (Day) 31 (Month) 10 (Year) 67
8. Total Volume Injected to Date: 353,941,090 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont Clay	Pleistocene	Outcrops		outcrop-clayey soil
Altaloma	Pleistocene			sand
Lissie	Pleistocene			sand, sandy clay, clay
Pliocene & Miocene (well T.D. 5,512 in Miocene sands)				
Frio	Oligocene	6,050-6,450		

WIC TX-69

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene Sands	
(2) Depth (Ft.)	5,250	
(3) Thickness (Ft.)	300	
(4) Formation Fluid Pressure, psi	2,276	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	0.464 psi/ft.	
(7) Age of Unit	Miocene	
(8) Porosity %	31.1	
(9) Permeability, millidarcies	333	
(10) Reservoir Temperature, °C	71°	
(11) Character and Areal Distribution	sand, sandstone	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	to 1450'			Unconsolidated sand of Pleis. and Pliocene age	fresh to slightly saline, may be hard contain iron

4. Mineral Resources in Area: Clear Lake Oil Field as 1-1/2 miles west. Occurs on a salt dome.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Four aldehydes, three glycols, acetate, acetic acid, alcohol, some heavy metals.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 20-150
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: 3-5

WIC TX-69

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** Possible aerobic breakdown of organics.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; minimum bacterial degradation due to anaerobic environment.

7. **Pre-injection Waste Treatment:** Filtration and pH adjust to about 5.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	32.75# H-40 ST&C	10-3/4	1567
Intermediate	9-7/8	23# J-55 LT&C	7	5490
Injection		Fibercast tubing	4-1/2	5201
Other		S.S. liner	4-1/2	5201-5450

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 650 sks Howco Lite Wt. + 100 sks cement w/2% CaCl2 - 7 inch' casing - 550 sks Howco Lite Wt. w/850 sks Mary Neal Incor mixed 50/50 Pozmix "A"

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** TLW type S liner packer set 5201 ft; 10-3/4 inch Davis type 600 Guide shoe; 10-3/4 inch David Fill up Float Collar type 700; 4 Bemoco Type "E" Centralizers, @ 1540, 1500, 1468, and 1439 ft; 7" David Fill up Float Collar Type 704, 23 Centralizers.

5. **Bottom Hole Completion:** Perforations - 5349-5389 ft, and 5325-5345 ft (4 shots/ft.)

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Plate type and a cartridge type filter.

WTC TX-69

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	12/71	**Average**	298	**Maximum**	369
"	12/70		194		308
"	12/69		167		160
"	12/68		189		276

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	12/71	**Average**	458	**Maximum**	507
"	12/70		450		600
"	12/69		327		425
"	12/68		460		505

3. **Annual Volume Injected, gal.**

A. 19 71 103,312,320 B. 19 70 113,825,000 C. 19

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company well (WDW-45) in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Monitoring well. Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually.

C. **Restrictions of Operation Procedures:** Maximum surface injection pressure of 1500 psig and rate of 400 gpm.

Well Id. Code: TX-70

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: International Pollution Control, Inc.
P.O. Box 2546 - Houston, Texas 77001

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 27°42'30"/97°27'54"
3. **Well Location (Legal Description):** 3020 ft. from the north line and 260 ft. from the east line of Sec. 15, Boheman Colony Lands Subdivision, Nueces Cty.
4. **County:** Neuces **State:** Texas
5. **SIC Classification:** 4952

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Cleaning acid wastes, caustic neutralized hydrofluoric acid wastes, alkaline wastes, oily wastes, Tetra-ethyl lead wastes, other wastes.
2. **Date Well Permitted:** 12/2/69 **Completed:**
3. **Injection Rate:** 12,000,000 gpy
4. **Injection Pressure:** 80 psi
5. **Total Depth of Well:** 4800
6. **Name, Age, and Depth of Injection Zone:** Miocene sand, Miocene, 4600
7. **Date Injection Began: (Day)** 24 **(Month)** 04 **(Year)** 72
8. **Total Volume Injected to Date:** 4,279,888 (7/72) **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		sand, clay
Lissic	Pleistocene			sand, gravel
Willis	Pliocene		1500	sand
Goliad	Pliocene			sand, shale
Lagarto	Miocene	1900		sand
Oakville	Miocene		2800	sand, sandstone
Catahoula	Miocene			tuff

(a)

WIC TX-70

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sands	
(2) Depth (Ft.)	4600	400
(3) Thickness (Ft.)		4200
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Miocene	Pliocene & Miocene
(8) Porosity %	30.7	
(9) Permeability, millidarcies	1850	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Thick unconsolidated sand beds	clay, sands

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	400		clay, sand	fresh water for municipal and industrial use
Lissie				sand, gravel	

4. Mineral Resources in Area: There are several oil and gas wells reported in the vicinity of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acids, hydrocarbons, bases, heavy metals.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 72,000
   C. Specific Gravity: 1.067
   D. Temperature: N/A
   E. pH: 1

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Possible corrosion due to action of H_2SO_4 and NaOH.

5. **Degradability Level and Rate:** Possible chemical degradation of organics by H_2SO_4 and NaOH.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, biological activity minimized in anaerobic environment.

7. **Pre-injection Waste Treatment:** Primary treatment by charcoal filtration, cartridge filter (polishing).

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		H-40 32#/ft.	10-3/4	586
Intermediate		J-55 23#/ft.	7	4770
Injection	fiberglass	1.95#/ft.	2-7/8	4770
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch 350 sacks of Lite Pozmix + 2% $CaCl_2$ + 100 sacks of Class H to the surface; 7 inch - 1000 sacks of Lite Pozmix + 18% NaCl + 750 gallons of resin cement to surface.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforations 4632-4715 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Fiberglass holding tank from filters, fiberglass pipes.

2. **Filters:** Charcoal filtrators (fiberglass steel containers); cartridge polishing filter.

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	6/72	**Average**	35	**Maximum**	50
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	6/72	**Average**	80	**Maximum**	110
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19 72 4,279,888 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: TX-71

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Dow Chemical Company
Plant 13 - Freeport, Texas 77541

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 28°59'41"/95°24'31"
3. Well Location (Legal Description): 9565.7 feet from north line and 1.3 ft. from west line of Alexander Calvit Survey, Ab. 49.
4. County: Brazoria State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Organic and inorganic fluid waste from the manufacture of glycerine.
2. Date Well Permitted: 2/27/70 Completed:
3. Injection Rate: 24,000,000 gpy
4. Injection Pressure: 566 psi
5. Total Depth of Well: 6322
6. Name, Age, and Depth of Injection Zone: Miocene sands - Miocene - 6300
7. Date Injection Began: (Day) 19 (Month) 03 (Year) 71
8. Total Volume Injected to Date: 18,128,820 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC TX-71

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sands	
(2) Depth (Ft.)	6300	1000
(3) Thickness (Ft.)		5300
(4) Formation Fluid Pressure, psi	2800 (at 6200 ft.)	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	0.85 psi/ft.	
(7) Age of Unit	Pliocene-Miocene	
(8) Porosity %	28-32	
(9) Permeability, millidarcies	1000	
(10) Reservoir Temperature, °C	82° (at 6100 ft.)	
(11) Character and Areal Distribution	unconsolidated sand, large areal extent	clays and sands

C. Chemical Characteristics of Formation Fluids: saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Oil and gas.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Organic and inorganic fluid waste from the manufacture of glycerine. Phenol, glycerine, expoxy resin, epichlorohydrin.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.25
   - D. Temperature: N/A
   - E. pH: 11.2

3. **Toxicity:** Ingestion of high concentrations of NaCl and phenol inhibited by strong taste and odor.

4. **Reactivity with Surface Equipment Components:** Corrosion due to high NaCl concentration similar to seawater, NaOH corrosive to aluminum.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably sterile at injection, bacterial activity inhibited by anaerobic conditions.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		H-40 32.75#/ft.	10-3/4	1359
Intermediate		J-55 23#/ft.	7	6323
Injection		J-55 9.5#/ft.	4-1/2	6322
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 590 sks Trinity Lite Wate, 200 sks Class A neat cement - to surface. 7 inch casing - 742 sks Trinity Lite Wate, 200 sks Type H and 405 sks Trinity Lite Wate.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker Lock set packer at the base of the injection tubing.

5. **Bottom Hole Completion:** Screened at 6276-6318

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TX-71

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	91	118
"	12/71	77	84
"	6/71	63	64
"			

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	566	740
"	12/71	369	530
"	6/71	664	700
"			

3. **Annual Volume Injected, gal.**

A. 1972 12,251,040 B. 1971 5,877,780 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company well (WDW-76) in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing & bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Surface injection pressure psig.

Well Id. Code: TX-72

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Petronila Elementary Campus
Rt. 3, Box 49 - Robstown, Texas 78380

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 27°40'08"/97°38'06"
3. **Well Location (Legal Description):** Vance Vannoy - SE/4 of Sec. 9 R&W S/D of Hoffman Ranch Tract, Nueces County.
4. **County:** Nueces **State:** Texas
5. **SIC Classification:** 4959

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Effluent from domestic aeration sewage treatment plant.
2. **Date Well Permitted:** 5/27/70 **Completed:**
3. **Injection Rate:** 240,000 ga./yr.
4. **Injection Pressure:** Gravity
5. **Total Depth of Well:** 8 shallow sand wells 25 to 35 ft.
6. **Name, Age, and Depth of Injection Zone:** Shallow sands, 15
7. **Date Injection Began: (Day)** **(Month)** 01 **(Year)** 70
8. **Total Volume Injected to Date:** 7,190,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Septic tank and drain field.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	15	sand
Top Soil		7	7	black soil
Shale		7 -25	7-25	tight clay
Sand		25-32	25-32	fine absorbent sand

(a)

WIC TX-72

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	shallow sands	none
(2) Depth (Ft.)	15	
(3) Thickness (Ft.)	15	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Recent	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	Atmospheric	
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Gulf Coast Aquifer	200	700		sands	brackish water

4. Mineral Resources in Area: Petroleum products (oil & gas)

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Treated sewerage from the school--not more than 20 mg/l BOD. The effluent is chlorinated.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 20
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: Ambient
   E. pH: N/A

WIC TX-72

3. **Toxicity:** Possible toxicity from bacteria.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** Possible breakdown of some organics in aerobic environment.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, degradation of organics minimal in anaerobic environment.

7. **Pre-injection Waste Treatment:** Aeration treatment plant with 20 minute detention, chlorination at a residual of 1.0 ppm.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Concrete sewer tile	18	8
Intermediate		perforated plastic tube	4	20
		gravel to well depth		
Injection	All pipe is gravel packed.			
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforated completion

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Complete Wasp treatment plant.

2. Filters: N/A

3. **Pumps:** Gardner-Denver Company air pump.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	4.85	5.90
"	7/71	4.85	5.90
"	1/71	6.25	6.50
"	7/70	4.85	5.55

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	6/72	gravity flow	
"	7/71	gravity flow	
"	1/71	gravity flow	
"	7/70	gravity flow	

3. **Annual Volume Injected, gal.**
A. 1972 1,240,000 B. 1971 2,900,000 C. 1970 3,050,000

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Graduated cylinders 500cc for solid measurement. Simple test equipment for chlorine content. Daily inspection.

B. **Sampling Frequency and Water Quality Parameters Measured:** Daily

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immed.

C. **Restrictions of Operation Procedures:** Injection pressure must be gravity flow.

Well Id. Code: TX-73

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Malone Service Company
P.O. Box 709 - Texas City, Texas 77590

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°19'33"/94°54'07"
3. Well Location (Legal Description): 5500 ft. from north line and 11,900 ft. from west line of Samuel C. Bundich Survey, Ab. 7, Galveston County, Tex.
4. County: Galveston State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from operation of a petrochemical plant.
2. Date Well Permitted: 2/18/70 Completed:
3. Injection Rate: 54,000,000 gpy
4. Injection Pressure: 850 psi
5. Total Depth of Well: 5120
6. Name, Age, and Depth of Injection Zone: Miocene sands, Miocene, 4900
7. Date Injection Began: (Day) 01 (Month) 01 (Year) 71
8. Total Volume Injected to Date: 69,053,075 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	1100	sand, clay
Lissie	Pleistocene	1100		sand, gravel
Willis	Pliocene			undifferentiated sand, clay
Goliad	Pliocene			and shale
Lagarto	Miocene			sandstone
Oakville	Miocene			

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sands	
(2) Depth (Ft.)	4900	1100
(3) Thickness (Ft.)		3800
(4) Formation Fluid Pressure, psi	Est. .45 psi/ft.	
(5) Lithostatic Pressure, psi	Est. 1.0 psi/ft.	
(6) Hydrofracturing Pressure, psi	Est. 1.0 psi/ft.	
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	30	
(9) Permeability, millidarcies	3000	
(10) Reservoir Temperature, °C	70°	
(11) Character and Areal Distribution	Massive sands	Interbedded clays and sands

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	1100		clay, sand	fresh water for both domestic and Industrial use

4. Mineral Resources in Area: Petroleum is produced at 5100 ft. from Hitchcock Field which is three miles west of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): The waste effluent is from the operation of a petrochemical plant. (Sulfates, chlorides, sodium, iron).

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: N/A

B. Conc. Dissolved Solids, mg/l: N/A

C. Specific Gravity: 1.025

D. Temperature: N/A

E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection, biological activity minimal due to anaerobic conditions and lack of substrate

7. Pre-injection Waste Treatment: Filtration and pH control.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		H-40 32.75#/ft.	10-3/4	1213
Intermediate		J-55 26#/ft.	7	5120
Injection		J-55 10.2#/ft.	3-1/2	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 490 sks of Class A + 12% Gel and 2% $CaCl_2$; 7-inch casing 1120 sks of Class A + 10% NaCl + 8% Gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Otis retrievable packer at 4865 ft. - 15 Centralizers on the 7 in.casing.

5. Bottom Hole Completion: Perforated 4912-4995.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: Filters are used - type unknown.

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	6/72	**Average**	138	**Maximum**	138
"	6/71		138		138
"	1/71		125		125
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	6/72	**Average**	850	**Maximum**	900
"	6/71		1100		1225
"	1/71		250		250
"					

3. **Annual Volume Injected, gal.**
A. 1972 26,997,500 B. 1971 42,055,575 C. 1970

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immed.

C. **Restrictions of Operation Procedures:** pH 4.5 to 6.6 maintained; maximum surface injection pressure - 1500 psig; maximum rate - 150 gpm.

Well Id. Code: TX-74

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: City of Lamesa, City Hall
Lamesa, Texas 79331

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 32°44'55"/101°49'21"
3. Well Location (Legal Description): 2375 ft. from the west line and 280 ft. from south line of section 7, Block 35, TEN
4. County: Dawson State: Texas
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Rain water pumped in for recharge to be able to pump out for use.
2. Date Well Permitted: 6/16/70 Completed:
3. Injection Rate: 29,000,000 gpy
4. Injection Pressure: Gravity
5. Total Depth of Well: 205
6. Name, Age, and Depth of Injection Zone: Permian, 205 ft.
7. Date Injection Began: (Day) (Month) 11 (Year) 70
8. Total Volume Injected to Date: 28,722,800 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Permian	0	200	sand, clay, shale, caliche

(a)

WIC TX-74

B. **Geologic Description of Injection Unit and Other Possible Units**

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	170	
(3) Thickness (Ft.)	35	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %	Permian	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. **Chemical Characteristics of Formation Fluids:** N/A

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala				sandstone	fresh

4. **Mineral Resources in Area:** No mineral resources reported in the area of the injection well.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Rain water. Volume - 160 gpm.

2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: 6.8

WIC TX-74

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; no biological activity due to lack of substrate and anaerobic conditions.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection			12-3/4	205
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 12-3/4 inch casing - from surface to 50 ft. cemented.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforations in bottom 35 ft. of casing bottom 155 ft. of casing gravel packed.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TX-74

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	8/71	**Average**	140	**Maximum**	
"	6/71		140		
"	11/70		138		
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	8/71	**Average**	gravity	**Maximum**	
"	6/71		gravity		
"	11/70		gravity		
"					

3. **Annual Volume Injected, gal.**
A. 1971 ____ ____ B. 1970 198,800 C. 19__ ____

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations.

C. **Restrictions of Operation Procedures:** Operating injection pressure shall not exceed - 50 psig.

Well Id. Code: TX-75

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NO-UP
Operating Company Name and Address: Amoco Production Company
P.O. Box 351 - Alvin, Texas 77511

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°22'21:/95°56'45"
3. Well Location (Legal Description): 3507 ft. from the south line and 542 ft. from east line of James Smith Survey, Ab. 176, Galveston County, Texas.
4. County: Galveston State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste is from a petroleum refinery operation.
2. Date Well Permitted: 4/3/70 Completed:
3. Injection Rate: 37,000 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 9780
6. Name, Age, and Depth of Injection Zone: Goliad, Miocene, 6180
7. Date Injection Began: (Day) 23 (Month) 04 (Year) 70
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene		1100	fine grained
Lissie	Pleistocene			sand, gravel
Willis	Pliocene		5080	sands, clays
Goliad	Pliocene			sand

WIC TX-75

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Goliad	fms. below Beaumont
(2)	Depth (Ft.)	6180	1100
(3)	Thickness (Ft.)	20	5000
(4)	Formation Fluid Pressure, psi	2850 psi @ 6500 ft	
(5)	Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7)	Age of Unit	Miocene	
(8)	Porosity %	34	
(9)	Permeability, millidarcies	2000	
(10)	Reservoir Temperature, °C	74°	
(11)	Character and Areal Distribution	salt water sands	clays, sands

C. Chemical Characteristics of Formation Fluids: Cl - 80,00 mg/1, Na - 46,689 mg/1, Ca - 3040 mg/1, HCO_3 - 127 mg/1.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont Clay	0	1100		sand, clay	fresh water for municipal & industrial use
Alta Loma Sand Member				sand	fresh

4. Mineral Resources in Area: Oil or gas resources of the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: TX-34 4-1/2 miles NNW; TX-73 - 5 miles SE; Pan American Petroleum Corp well no. 86 injecting salt water into Erie section 10,000 ft. SE.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): The waste is from a petroleum refinery operation.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.001
   - D. Temperature: N/A
   - E. pH: 9.4

WIC TX-75

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Not sterile at injection, biological activity minimized by anaerobic conditions and lack of substrate.

7. **Pre-injection Waste Treatment:** pH treatment.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			9-5/8	1526
Intermediate			5-1/2	9767
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Block squeeze cementing above and below injection. Zone to confine the injection fluid. 9-5/8 inch casing - 820 sks common cement w/10% gel; 5-1/2 inch casing - 310 sks. 50/50 set cement w/7.2% gel.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforated completion 6180 to 6190 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported it a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. Regulatory Aspects

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Surface injection pressure shall not exceed 2500 psig.

Well Id. Code: TX-76

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Dow Chemical USA, Oyster Creek Division, Freeport, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data:** (Day) 01 (Month) 10 (Year) 72
2. **Latitude and Longitude:** 28°59'43"/95°23'52"
3. **Well Location (Legal Description):** 4220 ft. north of west-central interior corner & 1068 ft east of west surv. line of Maurice Henry Surv. Ab. Ab-74
4. **County:** Brazoria **State:** Texas
5. **SIC Classification:** 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Organic and inorganic fluid waste from the manufacture of glycerine
2. **Date Well Permitted:** 5/13/70 **Completed:**
3. **Injection Rate:** 50,000,000 gpy
4. **Injection Pressure:** 550 psi
5. **Total Depth of Well:** 6476
6. **Name, Age, and Depth of Injection Zone:** Catahoula Pliocene-Miocene 3300-6300
7. **Date Injection Began:** (Day) 01 (Month) 01 (Year) 72
8. **Total Volume Injected to Date:** 23,303,504 (Gallons)
9. **Date Injection Ceased:** (Day) N/A (Month) (Year)
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TX-76

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sands	
(2) Depth (Ft.)	3300	1300
(3) Thickness (Ft.)	3200	4700
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sands and clays	Clays and sands

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium				clay & gravel	TDS 1000 ppm
Beaumont				sand & clay	fresh water

4. Mineral Resources in Area: Oil and gas is produced from salt dome structures of Miocene age. Sulfur is being produced at nearby Bryand Mound Salt Dome. Salt is being produced from Stratton Ridge Salt Dome by Dow Chemical who also operates a hydrocarbon storage facilities in the salt cavities.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Volume 50 gpm. Sodium hydroxide, phenol, acetone, cumene sodium phenate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 80,000
   C. Specific Gravity: 1.0
   D. Temperature: 150°F
   E. pH: 12

3. **Toxicity:** NaOH are highly toxic.

4. **Reactivity with Surface Equipment Components:** NaOH corrodes Aluminum fixtures.

5. **Degradability Level and Rate:** Possible degradation of organics by NaOH.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably sterile at injection due to strong phenol biological degradation or organics minimal under anaerobic conditions.

7. **Pre-injection Waste Treatment:** Clarification and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	H-40 32.75	10-3/4	1297
Intermediate				
Injection			7	6218
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 590 sks TLW and 200 sks Class A cement with 2% CaCl; 7 inch casing - 800 sks Lite Wate + 200 sks common H and 1400 sks of Lite Wate.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Open hole completion - screened and gravel packed through injection interval 6218-6288.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC TX-76

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/72	Average	126	Maximum	165
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/72	Average	550	Maximum	780
"					
"					
"					

3. Annual Volume Injected, gal.
A. 1972 23,303,504 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported it a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company well (WDW-71) in immediate vicinity.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. Restrictions of Operation Procedures: Not to exceed as surface injection pressure 2500 psi (6500 ft) and 1200 psi (3300 ft.)

Well Id. Code: TX-77

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC **Operational Status:** PC
Operating Company Name and Address: Gulf Chemical and Metallurgical Corp.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 09 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Galveston State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TX-77

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC TX-77

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC TX-77

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program
   A. Monitoring Devices and Data: ____________________
   B. Sampling Frequency and Water Quality Parameters Measured: ____________________
   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________
2. Contingency Plan for Well Failure During Operation: ____________________
3. Regulatory Aspects
   A. Construction Requirements: ____________________
   B. Monitoring Requirements: ____________________
   C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-78

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Rohm and Haas Texas Incorporated
P.O. Box 672 - Deer Park, Texas 77536

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 2904'/47"/95°06'11"
3. Well Location (Legal Description): 7800 ft. from south line and 900 ft. from west line of George Ross Surv. Ab.,-646, Harris County, Texas.
4. County: Harris State: Texas
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Ammonium sulfate cooling tower water.
2. Date Well Permitted: 7/10/72 Completed:
3. Injection Rate: 80 gpm
4. Injection Pressure: 220 psi
5. Total Depth of Well: 6030
6. Name, Age, and Depth of Injection Zone: Frio Group, Oligocene, 5720-6080
7. Date Injection Began: (Day) 01 (Month) 04 (Year) 71
8. Total Volume Injected to Date: 20,300,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	300	clay w/sand
Montgomery	Pleistocene	300		sand, gravel
Bently	Pleistocene		2350	clay, silt, sand
Willis	Pleistocene			sandstone
Goliad	Pliocene	2650	2850	sand, clay
Oakville-Catahoula	Miocene			sandstone
Frio	Oligocene	5720	360	sandstone

(a)

WIC TX-78

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Frio	Fms. below Willis
(2) Depth (Ft.)	5720	2350
(3) Thickness (Ft.)	360	3050
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Oligocene	Tertiary
(8) Porosity %	33	
(9) Permeability, millidarcies	400	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	permeable sand	clays, sands

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	300		sand, clay	potable groundwater
Montgomery	300			clay, salt,	
Bently		2350		sand, gravel	

4. Mineral Resources in Area: Oil and gas wells are reported in the area of the injection well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Shell Chemical Co., 2 miles west; 5 wells, 9 miles SE (industrial). Three improperly cased abandoned wells about 5000 feet from injection well and two shallower improperly cased wells 3000 and 4000 feet from injection well.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonium sulfate cooling tower water.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Corrosion of metal fixtures with continued contact with H_2SO_4.

5. **Degradability Level and Rate:** Possible chemical degradation of some organics.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, oxygen in $(NH_4)_2SO_4$ wastes will permit aerobic breakdown of some organics.

7. **Pre-injection Waste Treatment:** Filtration

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		H-40 32#/ft.	10-3/4	2007
Intermediate		F-J 34#/ft.	9-5/8	2698
		J-55 23#/ft.	7	5684
Injection		K-55 11.6#/ft.	4-1/2	5634 -
Other		slotted liner 10.5#/ft.	4-1/2	5696-4907

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Existing casing 1) 380 sks of common + 1% $CaCl_2$. 2) 1st stage - 175 sks of 50/50 Pozmix + 1% HR-4, 2nd stage - 320 sks of Halliburton Lightweight + 100 sks of Common.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** TIW Packer with sealing assembly on 4-1/2 inch injection string.

5. **Bottom Hole Completion:** Slotted steel liner set 5696-5907 and gravel packed.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Routine cleaning and acidizing operation every 3 to 6 months - 1000 gal. of 12% HCl and 3% HF acids.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** Pressurized graded sand, upflow filter - U.S. Filter Corp., Model U7.

WIC TX-78

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	6/72	**Average**	80	**Maximum**	110
"	7/71		47		60
"	4/71		32		60
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	6/72	**Average**	220	**Maximum**	240
"	7/71		180		198
"	4/71		50		86
"					

3. **Annual Volume Injected, gal.**
A. 1972 17,400,000 B. 1971 12,900,000 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Wellhead and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported it a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous monitoring.

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume; report biannually; 5% deviations report immediately.

C. **Restrictions of Operation Procedures:** Maximum surface injection pressure 2000 psig; maximum injection rate - 250 gpm.

Well Id. Code: TX-79

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: E.I. DuPont de Nemours and Co.
Ingleside, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 27°52'42"/97°14'50"
3. Well Location (Legal Description): T.T. Williamson Survey, Ab. 292, 614' south of the north line and 1491' east of the west line.
4. County: San Patrico State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Anhydrous HCl gas with fresh water.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 5308 ft.
6. Name, Age, and Depth of Injection Zone: Miocene sand, 5090 - 5308 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	400 - 500	sand, clay
Lissie	Pleistocene	400-500		sand, clay
Goliad	Pliocene			sand
Upper Miocene	Miocene			sand
Miocene	Miocene	4000		sand, shale

WIC TX-79

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sand	
(2) Depth (Ft.)	5090	400
(3) Thickness (Ft.)	300	4700
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Pleist - Miocene
(8) Porosity %	30	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	72°	
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	400		sand, clay	poor

4. Mineral Resources in Area: Oil and gas reservoirs in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Oil and gas wells

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Anhydrous HCl gas with fresh water.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 1.0

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive effect of aqueous HCl

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; no biological activity.

7. Pre-injection Waste Treatment: Primary filtration, polish filtering.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48# H-40	13-3/8	1005
Intermediate		36# K-55	8-5/8	5107
Injection		Fibercast tubing	4-1/2	5090
Other		Zirconium liner	4-1/2	5090-5308

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 23 centralizers on 8-5/8 inch casing; 8 centralizers of 13-3/8 inch casing.

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-79

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum surface injection pressure 2000 psig; maximum rate - 350 gpm.

Well Id. Code: TX-80

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: American Oil Company
P.O. Box 401 - Texas City, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 72
2. Latitude and Longitude: 29°22'31"/95°54'22"
3. Well Location (Legal Description): 6450 ft. FWL and 3120 ft. FNL of John Grant Survey, Abs. No. 72
4. County: Galveston State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from production of finished petroleum products ranging from LPG to petroleum coke, anlizdrous ammonia, aromatics. (benzine, toluene, xylene), styrene and sulfuric acids.
2. Date Well Permitted: 11/23/70 Completed:
3. Injection Rate: 72,000,000 gpy
4. Injection Pressure: 350 psi
5. Total Depth of Well: 6960 ft.
6. Name, Age, and Depth of Injection Zone: Goliad, Pliocene 6500 - 6900 ft.
7. Date Injection Began: (Day) (Month) (Year) 70
8. Total Volume Injected to Date: 36,225,168 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC TX-80

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Goliad	
(2) Depth (Ft.)	6500	1100
(3) Thickness (Ft.)	400	5400
(4) Formation Fluid Pressure, psi	2850 at 6500 ft.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Pliocene	Pliocene
(8) Porosity %	30	
(9) Permeability, millidarcies	2000	
(10) Reservoir Temperature, °C	74°	
(11) Character and Areal Distribution	sand widespread	clay, sand widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	1100	extensive	clay, sand	fresh

4. Mineral Resources in Area: Oil and gas resources in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Four disposal wells within 4 miles; 40 abandoned oil and gas test wells within 3-1/2 miles.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Industrial aqueous waste consisting of process water including: mixed caustic, sour water, and anion rinse water.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-80

3. Toxicity: Possible damage if ingested due to presence of acid and caustic residues.

4. Reactivity with Surface Equipment Components: Possible corrosion of metal fixtures.

5. Degradability Level and Rate: Breakdown of organics in acid solution.

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial acitivity minimal.

7. Pre-injection Waste Treatment: pH adjustment, hydrocarbon skimmed off using oil-water separators (API separators).

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32.75# H-40	10-3/4	1486
Intermediate				
Injection		J-55	7-5/8	6956
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 560 sks TLW w/4% gel, 7.5% salt + 200 sks Class H w/2% $CaCl_2$; 7-5/8 inch casing - 1250 sks Lite Wate + 510 sks 50-50 Pozmix

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 26 centralizers

5. Bottom Hole Completion: Perforated: 6740-6820 and 6824-6844 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-80

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	1/72	Average	141	Maximum	490
"	6/72		151		353
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1/72	Average	260	Maximum	350
"	6/72		350		800
"					
"					

3. Annual Volume Injected, gal.
A. 1972 36,225,168 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of all wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-81

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Dow Chemical
Freeport, Texas 77541

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 28°59'41"/95°23'54"
3. Well Location (Legal Description): 445.98 ft. west from the northeast corner and 391.97 ft. south in the John A. Wharton Survey, Abs. 383.
4. County: Brazoria State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Organic and inorganic fluid waste from the manufacture of glycerine.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 28,000,000 gpy
4. Injection Pressure: 340 - 410 psi
5. Total Depth of Well: 6507 ft.
6. Name, Age, and Depth of Injection Zone: Miocene sand, 3300 - 6300 ft.
7. Date Injection Began: (Day) 18 (Month) 04 (Year) 71
8. Total Volume Injected to Date: 50,692,484 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0		sand, gravel
Beaumont	Pleistocene		1200	clay, sand
Lissie	Pleistocene	1200		sand, gravel
Willis	Pleistocene			sandstone
Goliad	Pliocene			sandstone
Lagarto	Miocene			clay, silt , sand
Oakville	Miocene			sand
Catahoula	Miocene			sand

WIC TX-81

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	6200	1200
(3) Thickness (Ft.)	200	5000
(4) Formation Fluid Pressure, psi	0.465 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	0.85 psi/ft est.	
(7) Age of Unit	Miocene	Pliocene-Miocene
(8) Porosity %	30	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	70°	
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium			variable	sand, gravel	potable
Beaumont		1200	extensive	clay, sand	potable

4. Mineral Resources in Area: Oil and gas in the immediate area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Glycerine, tetrachlorohexene, ethers, sodium hydroxide, sodium chloride, and sodium carbonate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 100,000
   C. Specific Gravity: 1.016
   D. Temperature: 100° F
   E. pH: 13.9

3. **Toxicity:** Possible toxicity from high NaCl concentration.

4. **Reactivity with Surface Equipment Components:** Corrosion due to high NaCl concentration; caustic corrosion of aluminum by NaOH.

5. **Degradability Level and Rate:** Possible breakdown of organics in concentrated NaOH.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Conductor pipe	16	81
Intermediate	15	32.72# H-40	10-3/4	1301
	9-7/8	26.4# K-55 ST&C	7-5/8	6294
Injection		15.5# K-55 Buttress	5-1/2	6167
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 590 sks Trinity Lite Wate + 200 sks Class A w/2% CaCl$_2$; 7-5/8 inch casing - 400 sks TLW + 200 sks Class H

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Float shoe and collar @ 6167 ft.; stage collar @ 3336 ft., Brown Oil Tool 5-1/2" x 7-5/8" model H-1-RSP; hydralic set packer (5.70')

5. Bottom Hole Completion: Open hole 6295-6356 ft. with gravel pack around screen liner (10-12 mesh); 6295-6355 underreamed to 12 inches.

6. Hydraulic Fracturing, Acidizing Programs, etc.: 3000 gallons acid mud.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Clear tank

2. Filters: N/A

WIC TX-81

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	7/71	Average	105	Maximum	147
"	1/72		88		122
"	6/72		14		31
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	7/71	Average	370	Maximum	460
"	1/72		412		455
"	7/72		343		430
"					

3. Annual Volume Injected, gal.

A. 1972 28,000,000 B. 1971 36,950,315 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company well.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-82

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: E.I. DuPont de Nemours and Company
P.O. Box 347 - LaPorte, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°41'59"/95°02'54"
3. Well Location (Legal Description): 3835 ft. FNL and 15,592 ft. FWL of the Enoch Brinson League, Abs. No. 5
4. County: Harris State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant waste.
2. Date Well Permitted: 10/7/70 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 5350 ft.
6. Name, Age, and Depth of Injection Zone: Miocene sand, 5140 ft.
7. Date Injection Began: (Day) 28 (Month) 09 (Year) 72
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	600	clay
Montgomery	Pleistocene	600		clay, silt
Bently	Pleistocene			silt, sand
Willis	Pliocene	1200		sand
Goliad	Pliocene			sand
Oakville-Catahoula	Miocene			sand
Anahuac	Miocene	5350	1000	sand
Frio	Oligocene	6350	2350	sand, silt

WIC TX-82

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	4800	1200
(3) Thickness (Ft.)	550	3600
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	30	
(9) Permeability, millidarcies	500	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas production in the vacinity of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid, acetate, methanol, polyvinyl alcohol, cetra acetylamine, alkyl polysilicon defoamer.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 7,300
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

WIC TX-82

3. Toxicity: Methanol highly toxic to humans.

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Sedimentation, filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	32.75# H-40	10-3/4	1327
Intermediate	9-5/8	26.4# J-55	7-5/8	5170
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 600 sks Class H w/4% gel + 20% $CaCl_2$ followed by 200 sks Class H w/2% $CaCl_2$ and 1920 cu. ft. Pozmix w/2% gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 11 centralizers on 7-5/8 inch casing.

5. Bottom Hole Completion: Screened 5140-5170 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: All facilities stainless steel, fiberglass or rubber lined.

2. Filters: 3 primary vertical leaf filters; 2 secondary polish filters.

WIC TX-82

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of waste; monitor well and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-83

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: E.I. DuPont de Nemours and Co.
P.O. Box 347 - LaPorte, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°41'51"/95°02'54"
3. Well Location (Legal Description): 2960' south of the north line and 14,975' east of the west line of the Enoch Brinson League, Ab. 5
4. County: Harris State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant wastes.
2. Date Well Permitted: 10/7/70 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well. 5180 ft.
6. Name, Age, and Depth of Injection Zone: Miocene sand, 5141 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	600	clay
Montgomery	Pleistocene	600		clay, silt
Bently	Pleistocene			silt, sand
Willis	Pliocene			sand
Goliad	Pliocene	1200		sand
Oakville-Catahoula	Miocene			sand
Anahuac	Miocene	5350	1000	sand
Frio	Miocene	6350	2350	sand, silt

(a)

WIC TX-83

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miccene sand	
(2) Depth (Ft.)	4800	1200
(3) Thickness (Ft.)	380	4000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	30	
(9) Permeability, millidarcies	500	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont-Willis	0	1200	extensive	sand, gravel	

4. Mineral Resources in Area: Oil and gas

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acetic acid, acetate, methanol, polyvinyl alcohol, ceta acetylamine, alkyl polysilicone defoamer.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: 7,000
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC TX-83

3. Toxicity: Methanol highly toxic to humans.

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Filtration and sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15		10-3/4	1342
Intermediate	9-7/8		7-5/8	5180
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 900 sks Class H + 2% gel. + 20% $CaCl_2$; 1500 sks Pozmix + 6% NaCl + 2% gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 11 centralizers on the 10-3/4" casing. 19 centralizers on the 7-5/8" casing.

5. Bottom Hole Completion: screened - 5145 to 5180 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: All facilities stainless steel, fiberglass, or rubber lined.

2. Filters: 3 primary vertical leaf filters; 2 secondary polish filters

WIC TX-83

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous

2. Contingency Plan for Well Failure During Operation: Pump waste to other company well (TX-82) in immediate vicinity.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: TX-84

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: Odessa Natural Corp.
P.O. Box 3986 - Odessa, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 32°50'00"/101°20'24"
3. **Well Location (Legal Description):** 660' from the north line and 660' from the west line of Sec 1, Block 42, T. & P.R.R. Co. Survey
4. **County:** Ector **State:** Texas
5. **SIC Classification:** 2999

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Odessa Petrochemical complex wastes - waste from butadiene, olefir, styrene, and ammonia plants.
2. **Date Well Permitted:** 6/29/70 **Completed:**
3. **Injection Rate:** 31,000 gpd
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 6,000 ft.
6. **Name, Age, and Depth of Injection Zone:** San Andreas, Permian 4850 - 6000 ft.
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent			sand, gravel
Comanche	Cretaceous			sand, limestone
Dockum Group	Triassic			sandstone, shale
Ochoa Series	Permian			shale, evaporites, ss
Whitehorse Group	Permian			evaporites, shale, ss
Grayburg	Permian			dolomite
San Andreas	Permian	4800	900	limestone, dolomite

WIC TX-84

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	San Andreas	
(2) Depth (Ft.)	4800	125
(3) Thickness (Ft.)	900	4700
(4) Formation Fluid Pressure, psi	1947 (at 5000')	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	Triassic-Permian
(8) Porosity %	18	
(9) Permeability, millidarcies	4	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone dolomite widespread	limestone, dolomite, sandstone, shale widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Comanche & Alluvium	0	125		sand, gravel	TDS = 3000 ppm

4. Mineral Resources in Area: Oil and gas reservoirs located in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: There are several oil and gas wells reported in the area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 14,000
   C. Specific Gravity: 1.009
   D. Temperature: 70° F
   E. pH: 8.5

WIC TX-84

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal

7. Pre-injection Waste Treatment: Sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8-5/8	229
Intermediate		17# K-55	5-1/2	6000
Injection		Tubing	2-7/8	4850
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Multiple stage cementing tool @ 3000'

5. Bottom Hole Completion: Perforations 4850 - 6000 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Plactic lined retention pond.

2. Filters: N/A

(c)

WIC TX-84

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: ____________________

   B. Sampling Frequency and Water Quality Parameters Measured: ____________________

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

   A. Construction Requirements: ____________________

   B. Monitoring Requirements: ____________________

   C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-85

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Warren Petroleum Corporation
P.O. Box 1589 - Tulsa, Oklahoma

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°51'11"/94°52'51"
3. Well Location (Legal Description): William Bloodgood Argumentation Survey, Abs. No. 5, 775 ft. FEL and 1790 ft. FNL.
4. County: Chambers State: Texas
5. SIC Classification: 1311

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: 31,000 gallons of oily disulfide plus 59,000 gallons neutral caustic and some small amounts of mercaptons.
2. Date Well Permitted: 10/27/70 Completed:
3. Injection Rate: 200,000 gpy
4. Injection Pressure: gravity
5. Total Depth of Well: 1495 ft.
6. Name, Age, and Depth of Injection Zone: Barber Hill Salt Dome 1105 - 1495 ft.
7. Date Injection Began: (Day) 01 (Month) 01 (Year) 71
8. Total Volume Injected to Date: 290,215 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont-Lissie	Pleistocene	0	1100	clay, sand
Berber Hill Cap Rock		1100	120	limestone, dolomite

(a)

WIC TX-85

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Barber Hill	
(2) Depth (Ft.)	1100	1000
(3) Thickness (Ft.)	120	100
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	90°	
(11) Character and Areal Distribution	limestone	limestone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont-Lissie	0	1100	extensive	sand, clay	fresh

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 11 wells gravity flow into the salt dome.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Organic disulfides, mercaptins

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC TX-85

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: pH adjustment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate		15#/ft J-55	5-1/2	1108
Injection			2-7/8	1034
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer at 1042 ft.

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-85

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	8/71	Average	3.5	Maximum	4
"	4/72		5.2		10
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	8/71	Average	20" vac.	Maximum	27" vac.
"	4/72		20" vac.		27" vac.
"					
"					

3. Annual Volume Injected, gal.
A. 1972 180,000 B. 1971 200,339 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually

C. Restrictions of Operation Procedures: Maintain pH of 7.8 or lower; only injected with gravity flow at a monthly mazimum of 75,000 gallons.

Well Id. Code: TX-86

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND **Operational Status:** PND

Operating Company Name and Address: Ethyl Corp., Pasadena Plant
Harris Co. Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 73
2. Latitude and Longitude: 29°44'20"/95°10'42"
3. Well Location (Legal Description): Thomas Earle Survey, A - 18
4. County: Harris State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfuric acid - ammonium sulfate wastes containing cyanide and organic constituents.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 1,440,000 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 7000 ft.
6. Name, Age, and Depth of Injection Zone: Frio Group, Oligocene 6380-7000 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None - new plant

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene			sand, gravel, clay
Lissie	Pleistocene			sand, gravel, clay
Lager	Miocene			sand, gravel, clay
Anahuac	Oligocene			sand, gravel, clay
Frio	Oligocene			sand, gravel, clay

(a)

WIC TX-86

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Frio Group	
(2) Depth (Ft.)	6380	
(3) Thickness (Ft.)	620	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Oligocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, clay	

C. Chemical Characteristics of Formation Fluids: saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sulfuric acid and ammonium sulfate with cyanide and organics.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: HCN toxicity maximum in acidic medium, tissue destruction in concentrated H_2SO_4

4. Reactivity with Surface Equipment Components: Corrosion due to presence of sulfuric acid.

5. Degradability Level and Rate: Chemical breakdown of organics by sulfuric acid

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection, bacterial degradation by sulfate reduction.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate		48-61# K-55	13-3/8	2700
		23# K-55	7	6380
Injection		14# K-55	5-1/2	
Other				

2. Type and Amount of Cement, Cement Additiver, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: 4-1/2" OD or 6-5/8" OD slotted fibercast liner set in interval with gravel pack.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-86

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate; injection flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure; complete chemical analysis of wastes; monitor wellhead and annulus pressure, rates and total volume.

C. Restrictions of Operation Procedures: Maximim surface injection pressure 2500 psig and monthly volume injected 44 million gallons.

Well Id. Code: TX-87

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND
Operating Company Name and Address: Phillips Petroleum Co.
Box 358, Baker Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 . (Month) 10 (Year) 72
2. Latitude and Longitude: 35°44'17"/101°18'20"
3. Well Location (Legal Description): 7777 ft. from the south line and 1627 ft. from the west line of section 70, Black 46 of H & TC survey
4. County: Hutchinson State: Texas
5. SIC Classification: 2814

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste water from butadiene plant.
2. Date Well Permitted: 8/17/70 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Granite Wash, 3840 - 4975 ft
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC TX-87

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

WIC TX-84

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-88

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: El Paso Products Company
P.O. Box 3986 - Odessa, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 31°49'25"/102°20'07"
3. Well Location (Legal Description): 225 ft. FWL and 1890 ft. FSL of Sec. 38, Block 42, T25, I&P RR Survey
4. County: Ector State: Texas
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical production wastes of nylon
2. Date Well Permitted: 10/22/70 Completed:
3. Injection Rate: 800 gpm
4. Injection Pressure: 1200 psi
5. Total Depth of Well: 5733 ft.
6. Name, Age, and Depth of Injection Zone: San andres, Permian 4863 ft.
7. Date Injection Began: (Day) (Month) 03 (Year) 71
8. Total Volume Injected to Date: 194,446,000 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Comanche	Cretaceous			sandstone
Dockum Group	Triassic			shale, sandstone
Ochea Series	Permian			shale, evaporite
Whitehorse Group	Permian			evaporite, shale
Grayburg	Permian			dolomite
San Andres	Permian	4808		dolomite

(a)

WIC TX-88

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	San Andres	Dockum-Whitehorse
(2) Depth (Ft.)	4808	125
(3) Thickness (Ft.)	1000	4700
(4) Formation Fluid Pressure, psi	0.45 psi/ft est	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Permian	Triassic-Permian
(8) Porosity %	18	
(9) Permeability, millidarcies	4	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite	dolomite, evaporite, shale, sandstone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chemical plant wastes from the production of nylon.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 8.5

WIC TX-88

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48# H-40	13-3/8	236
Intermediate	12-1/4	40# K-55	9-5/8	4860
Injection				
Other		15.5# K-55	5-1/2	4793

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 250 sks class H; 9-5/8 inch casing - 1900 sks Litepoz + 700 sks class C w/4% gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
7/71		400
1/72		880
6/72		910

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
7/71		1080
1/72		1200
6/72		1200

3. Annual Volume Injected, gal.
A. 1972 155,000,000 B. 1971 117,508,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum daily volume of 40,000 barrels at maximum pressure of 2000 psig.

Well Id. Code: TX-89

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: Arco Steel Company
P.O. Box 1367, Houston, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°45'09"/95°10'58"
3. Well Location (Legal Description): W. Harris and Robert Wilson survey A-31
4. County: Harris State: Texas
5. SIC Classification: 3315

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Consists of two streams from napthalene sump waste and ammonia.
2. Date Well Permitted: 12/30/70 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 4805 ft.
6. Name, Age, and Depth of Injection Zone: Frio Group, Oligocene
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Plesitocene	0	300	sand, clay
Lissie	Pleistocene			sand, gravel, silt, clay
Willis	Pliocene			sand, gravel, clay
Goliad	Pliocene			sand, gravel, clay
Lagerto	Miocene			sand, gravel, clay
Anahuac	Oligocene	4000	700	clay
Frio Group	Oligocene	4700	2000	sand, clay

WIC TX-89

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Frio	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Oligocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, clay	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: none

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 9 wells in area none plugged

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC TX-89

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Filtered through two up-flow sand filters partles greater than 0.5 microns removed.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate		48-61# H-40 and K-55	13-3/8	2700
		86-43# J-55 and N-80	9-5/8	6300
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Cone shaped settling tank to settle filter backwash particles.

2. Filters: Two up-flow filters.

WIC TX-89

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: TX-90

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: Armco Steel Co.
P.O. Box 1367, Houston, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°45'09"/95°10'57"
3. Well Location (Legal Description): N/A
4. County: Harris State: Texas
5. SIC Classification: 3315

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Consists of two streams from napthalene sump and the ammonia liquor
2. Date Well Permitted: 12/3/70 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Frio Group, Oligocene 6300-7000 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC ______ TX-90 ______

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: ______

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: ______

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: ______

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): ______

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: ______
   B. Conc. Dissolved Solids, mg/l: ______
   C. Specific Gravity: ______
   D. Temperature: ______
   E. pH: ______

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC ______ TX-90 ______

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: TX-91

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: Monsanto Co.
P.O. Box 1311 - Texas City, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°22'39"/95°53'29"
3. Well Location (Legal Description): 58.4' FWL and 225.4' FSL of "The Terminal Land" within the Sylvester Bower Survey, Ab. - 24.
4. County: Galveston State: Texas
5. SIC Classification: 2819

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous solution of organic and inorganic compounds from production of organic trisodium salt formulation to be used in synthetic detergents.
2. Date Well Permitted: 10/21/70 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Miocene Sands, 5000 - 7500 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	120	sand, clay
Lissie	Pleistocene	120		sand, clay
Willis	Pliocene			
Goliad	Pliocene			sand
Miocene Sand	Miocene			sand

WIC TX-91

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene Sand	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas resources.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Oil and gas.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cyanide, nitrate, sulfate, chloride, sodium

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 286,000
   C. Specific Gravity: N/A
   D. Temperature: 140° F
   E. pH: 5.8 - 7.6

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection:
Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: pH adustment, dual mechanical filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Conductor pipe	20	100
Intermediate		Surface casing	13-3/8	2500
		Long string	9-5/8	2700
Injection		Tubing	5	5000-7500
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: Dual mechanical filtrators

3. **Pumps:** Centrifugal pumps

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

3. **Annual Volume Injected, gal.**

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

   A. **Monitoring Devices and Data:** Well head and annulus pressure; injection flow rate and volume.

   B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% varianc occurs.

   C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuously

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

   A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffedted by wastes.

   B. **Monitoring Requirements:** pH monitors, casing and bottom hole pressure tests, complete chemical analysis of wastes, monitor well head and annulus pressure, rates and total volume; report biannually.

   C. **Restrictions of Operation Procedures:** Surface injection pressure maximum - 2000 psig; maximum injection rate - 3400 barrels per day.

Well Id. Code: TX-92

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Cities Service Oil Company
P.O. Box 300 - Tulsa, Oklahoma

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 29°51'18"/94°54'00"
3. Well Location (Legal Description): Henry Griffith League, A-12
4. County: Chambers State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Petrochemical plant wastes.
2. Date Well Permitted: 3/71 Completed:
3. Injection Rate: 60,000 gpy
4. Injection Pressure: 40 psi
5. Total Depth of Well: 2203 ft.
6. Name, Age, and Depth of Injection Zone: Pliocene, 2000-2200
7. Date Injection Began: (Day) (Month) 04 (Year) 71
8. Total Volume Injected to Date: 75,646 (7/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont-Lissie	Pleistocene	0		sand, clay
Willis	Pliocene			sandstone
Goliad	Pliocene			sandstone
Salt beds	Pliocene			halite

WIC TX-92

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	2000	1450
(3) Thickness (Ft.)	100	650
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Pliocene	Pliocene
(8) Porosity %	30	
(9) Permeability, millidarcies	1000	
(10) Reservoir Temperature, °C	43°	
(11) Character and Areal Distribution	sandstone	clay, sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont-Lissie	0	1450	extensive	clay,sand	fresh

4. Mineral Resources in Area: Oil and gas production.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Petrochemical wastes including disulfide and oil

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 0.995
   - D. Temperature: 100°
   - E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: Possible breakdown of organics with heat.

6. Biological Level at Injection and Estimated Biological Level After Injection:
Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: None

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/2	24# H-40	8-5/8	134
Intermediate		14# J-55	5-1/2	2203
Injection		6#	2-3/8	2030
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:
8-5/8 inch casing - 50 sks Class A w/2% $CaCl_2$; 5-1/2 inch casing - 400 sks Class H w/4% gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforated: 2104 to 2120 feet.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-92

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/72	Average	8	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/72	Average	40	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 1972 52,000 B. 1971 49,354 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous monitoring.

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psig; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and total volume; report biannually.

C. Restrictions of Operation Procedures: Surface injection pressure maximum - 800 psig, monthly maximum volume - 90,000 gallons.

Well Id. Code: TX-93,94,95,96

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND **Operational Status:** PND

Operating Company Name and Address: Jefferson Chemical Company, Inc.
P.O. Box 847, Port Neches, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 14 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 29°57'53"/93°55"38"
3. **Well Location (Legal Description):** N/A
4. **County:** Jefferson **State:** Texas
5. **SIC Classification:** 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Brines, gycols, amines, and hydrocarbons from chemical plant
2. **Date Well Permitted:** 8/5/71 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** N/A
6. **Name, Age, and Depth of Injection Zone:** Miocene Sands 5300-5600 ft.
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene			clay
Lissie	Pleistocene			
Catahoula	Miocene			
Frio	Oligocene			

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 5%$CaCl_2$, 1% NaCl, 1% cycols 0.05% amines, 0.05% hydrocarbons

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 100
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.039
   - D. Temperature: 190° F
   - E. pH: 11.5 - 12.0

WIC TX-93,94,95,96

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal due to anaerobic conditions and lack of substrate.

7. Pre-injection Waste Treatment: Centrifuge, high rate sand filters, two 42,000 gallon steel storage and surge vessels.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		conductor casing	24	100
Intermediate		conductor casing	20	1300
		65# H-40	16	
Injection		51# K-55	10-3/4	
Other		23# K-55 ST&C	7	

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer and overshot combination at bottom of injection pipe

5. Bottom Hole Completion: 6-5/8" OD screen and blank riser filled with gravel pack (stainless steel wire and schedule 40 perforated pipe.)

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two 42,000 gallon steel tanks

2. Filters: Rapid sand filters

3. **Pumps:** Two quintuplex pumps at 700 gpm

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
N/A		
"		
"		
"		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
N/A		
"		
"		
"		

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Well head and annulus pressure; injection flow rate; injection flow volume.

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if a 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous

2. **Contingency Plan for Well Failure During Operation:** Pump wastes to other company wells in immediate vicinity.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psig; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor wellhead and annulus pressure rates and total volume; report biannually.

C. **Restrictions of Operation Procedures:** Maximum surface injection pressure 1750 psig; maximum rate of injection 1 million gallons per day.

Well Id. Code: TX-97

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND **Operational Status:** PND

Operating Company Name and Address: Coastal States Petrochemical Co.
P.O. Drawer 521, Corpus Christi, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 02 **(Month)** 10 **(Year)** 72
2. **Latitude and Longitude:** 27°49'06"797°27'27"
3. **Well Location (Legal Description):** McBride Partition, Block D, from the NE corner proceed N 20°E 3480 ft. to a point in the J.L. Russel Farm Tracts
4. **County:** Nueces **State:** Texas
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Five waste streams - one each from the crude desalter, kerosene fractionator, diesel fractionator, cat cracker overhead, and the phosphoric acid settler.
2. **Date Well Permitted:** 3/31/72 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 6200 ft.
6. **Name, Age, and Depth of Injection Zone:** Miocene Sands 5000-6200 ft.
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene		400	clay
Lissie	Pleistocene			sand, gravel
Goliod	Pliocene			sand
Logarto	Miocene			clay
Oakville	Miocene			sandstone
Catahoula	Miocene			tuff, clay, bentonite

(a)

WIC TX-97

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sand	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	2200	
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %	30	
(9) Permeability, millidarcies	2000	
(10) Reservoir Temperature, °C	60°	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0	400	extensive	sand	potable

4. Mineral Resources in Area: Oil and gas

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Phenols, organic nitrogen cyanide, phosphoric acid, and other hydrocarbons.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 7-8.5

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metal fixtures due to phosphoric acid.

5. **Degradability Level and Rate:** Possible degradation of organic nitrogen compounds and phenols may degrade slowly even under anaerobic conditions.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection

7. **Pre-injection Waste Treatment:** Filtered after going through API separator.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** N/A

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. **Filters:** Sand and anthracite filters

WIC ______TX-97______

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-98

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: Coastal States Petrochemical Co.
P.O. Drawer 521, Corpus Christi, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 27°49'06"/97°27'27"
3. Well Location (Legal Description): N/A
4. County: Nueces State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from crude desalter, kerosene fractionator, diesel fractionator, cat cracker overhead, and phoshporic acid settler.
2. Date Well Permitted: 3/31/72 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Miocene Sands 5000-6000 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0	400	Clay
Lissie	Pleistocene			sand, gravel
Goliod	Pliocene			sand
Logarto	Miocene			clay
Oakville	Miocene			sandstone
Catahoula	Miocene			tuff, clay, bentonite

WIC TX-98

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Miocene sand	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	2200	
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %	30	
(9) Permeability, millidarcies	2000	
(10) Reservoir Temperature, °C	60°	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and Gas

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Phenol, organic nitrogen cyanide, phosphoric acid, other hydrocarbons.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosiosion of metal fixtures handling phosphoric acid.

5. Degradability Level and Rate: Possible degradation of organic nitrogen compounds, and phenols may degrade slowly even under anaerobes conditions.

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection: minor biological degradation of organic nitrogen compounds and phenols under anaerobic conditions.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-98

3. Pumps: ____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____

B. Sampling Frequency and Water Quality Parameters Measured: ____

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____

2. Contingency Plan for Well Failure During Operation: ____

3. Regulatory Aspects

A. Construction Requirements: ____

B. Monitoring Requirements: ____

C. Restrictions of Operation Procedures: ____

Well Id. Code: TX-99

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: Dow-Bodische Co.
602 Cooper Rd. - Freeport, Texas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 14 **(Month)** 08 **(Year)** 72
2. **Latitude and Longitude:** 29°00'34"/95°24'09"
3. **Well Location (Legal Description):** 7310.38' south of the north line and 1901.67' east of the west line of the Alexander Calvit Survey, Ab. - 49.
4. **County:** Brazoria **State:** Texas
5. **SIC Classification:** 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Aqueous solution of organic and inorganic constituents from a caprolactum plant - purification of caprolactum to apolymer grade material
2. **Date Well Permitted:** 7/16/71 **Completed:**
3. **Injection Rate:** 150 gpm
4. **Injection Pressure:** 400 psi
5. **Total Depth of Well:** 6100 ft.
6. **Name, Age, and Depth of Injection Zone:** Miocene sands, 5000 - 6100 ft.
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Discharge into the Dow Chemical Company canal

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	300	gravel, sand, clay
Beaumont	Pleistocene			sand, clay
Lissie	Pleistocene			sand, clay
Lagarto	Pliocene			sandstone, shale
Oakville	Miocene			sandstone, shale
Catahoula	Miocene			sandstone, shale

WIC TX-99

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Oakville-Catahoula	
(2) Depth (Ft.)	5470	
(3) Thickness (Ft.)	85	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	0.85 psi/ft est.	
(7) Age of Unit	Miocene	
(8) Porosity %	28 - 32	
(9) Permeability, millidarcies	200 - 1000	
(10) Reservoir Temperature, °C	67°	
(11) Character and Areal Distribution	sand extensive	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium			variable	sand, gravel	poor
Beaumont			extensive	sand, clay	potable

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Three other injection wells: TX-51, TX-71, and TX-59

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 10,000-30,000 ppm ammonium sulfate; 100,000 ppm sulfonated hydrocarbons; 3,000-5,000 ppm caprolactum; 2,000-3,000 ppm aromatic compounds (predominately benzene cyclohexane).
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.01
   D. Temperature: N/A
   E. pH: 4.0 - 8.0

WIC TX-99

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Readily attacks carbon steel, surface equipment lined with stainless steel.

5. Degradability Level and Rate: Possible bacterial breakdown of organic compounds.

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; little bacterial activity.

7. Pre-injection Waste Treatment: Filtered, transferred to clear tank and then to injection pumps.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32.75# H-40	10-3/4	1300
Intermediate		26# K-55	7	5085
		304 s.s. schedule 40	6-5/8	
Injection				
Other		304 s.s. schedule 40	4-1/2	

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Multiple stage cementing tool at 3300 ft.; Trinity Lite-Wate cement 0 - 1300 ft. followed by API Class "A" common cement with 2% CaCl.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer inside s.s. tail pipe at depth below 5085 ft.; centralizers used on surface casing.

5. Bottom Hole Completion: Gravel packed open hole.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Clear tank; stainless steel lines, rubber-lined.

2. Filters: N/A

WIC TX-99

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Well head and annulus pressure; injection flow rate and volume

B. **Sampling Frequency and Water Quality Parameters Measured:** Periodically measured and reported if 5% variance occurs.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuously

2. **Contingency Plan for Well Failure During Operation:** 600' x 60' x 7' clay lined pit.

3. **Regulatory Aspects**

A. **Construction Requirements:** All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. **Monitoring Requirements:** Casing and bottom hole pressure; complete chemical analysis of wastes; monitor well head and annulus pressure, rates, and total volume; report biannually.

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: TX-100

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN
Operating Company Name and Address: E.I. DuPont de Nemours Co., Beaumont Works
P.O. Box 3269 - Beaumont, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 14 (Month) 08 (Year) 72
2. Latitude and Longitude: 30°00'15"/94°00'25"
3. Well Location (Legal Description): J. S. Johnson Survey A-34
4. County: Jefferson State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Nitrogen compound production wastes.
2. Date Well Permitted: 7/26/71 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 5015 ft.
6. Name, Age, and Depth of Injection Zone: Frio, Miocene
4960 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Barged to the Gulf of Mexico and discharged beyond the Continental shelf.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		clay, sand
Montgomery	Pleistocene			clay, sand
Bentley (Lissie)	Pleistocene			clay, sand
Willis	Pliocene			
Anahuac	Miocene	1000		sand
Frio	Miocene			sand

(a)

WIC TX-100

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Frio	
(2) Depth (Ft.)	4960	1000
(3) Thickness (Ft.)	143	4000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %	28 - 34	
(9) Permeability, millidarcies	2052 - 2307	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand widespread	clay, sand widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay, sand	fresh
Lissie		800	extensive	clay, sand	fresh

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonium sulfate - 70,000 ppm Nitrils - 40,000 ppm, acrolein.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 120,000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 6.0 -7.0

3. **Toxicity:** HCN highly toxic, limit 0.2 ppm; acrolein also toxic; ammonium sulfate may be hazardous becouse of pH shift.

4. **Reactivity with Surface Equipment Components:** Corrosive

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Bacteria probably destroyed by HCN

7. **Pre-injection Waste Treatment:** Bio-pond with 14 day detention time.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		54.5# K-55	13-3/8	1627
Intermediate		40# K-55	9-5/8	4807
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8" casing - 1000 sks Halliburton Lite-Wate, 600 sks 50-50 Pozmix w/ 2% $CaCl_2$, 100 sks Class A w/ 2% $CaCl_2$; 9-5/8" casing - 1460 sks Halliburton Light cement w/ gilsonite followed by 200 sks common cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Guide show, float collar above 1st joint of 9-5/8" casing, 14 centralizers and two cement bashets were placed into the well.

5. **Bottom Hole Completion:** Gravel packed screen 4817 - 4960 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 4.1 million gallon (4.7 day retention) steel settling tank.

2. **Filters:** Primary and polishing filters.

WIC TX-100

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure: injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuously

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company well (TX-101).

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure test; complete chemical analysis of wastes; monitor well head and annulus pressure, rate, and total volume; report biannually.

C. Restrictions of Operation Procedures: Surface injection pressure shall not exceed 1500 psi.

Well Id. Code: TX-101

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: E.I. DuPont de Nemours Co., Beaumont Works
P.O. Box 3269 - Beaumont, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 14 (Month) 08 (Year) 72
2. Latitude and Longitude: 30°00'13"/94°00'22"
3. Well Location (Legal Description): J.S. Johnson Survey A-34
4. County: Jefferson State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Nitrogen compound production wastes.
2. Date Well Permitted: 7/26/71 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 5008 ft.
6. Name, Age, and Depth of Injection Zone: Frio, Miocene
4960 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Barged to Gulf of Mexico and discharged beyond the Continental shelf.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		clay, sand
Montgomery	Pleistocene			clay, sand
Bentley (Lissie)	Pleistocene		1000	clay, sand
Willis	Pliocene			
Anahuac	Miocene	1000		sand
Frio	Miocene			sand

WIC TX-101

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Frio	
(2) Depth (Ft.)	4960	1000
(3) Thickness (Ft.)	143	4000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %	28 - 34	
(9) Permeability, millidarcies	2052 - 2307	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand widespread	clay, sand widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay, sand	fresh
Lissie			extensive	clay, sand	fresh

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: TX-100

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonium sulfate - 70,000 ppm nitriles - 40,000 ppm, acrolein

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 120,000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 6.0 -7.0

3. Toxicity: HCN highly toxic; acrolein also toxic; ammonium sulfate may be hazardous due to pH shift.

4. Reactivity with Surface Equipment Components: Corrosive

5. Degradability Level and Rate: Possible bacterial degradation of organics.

6. Biological Level at Injection and Estimated Biological Level After Injection: Bacteria probably destroyed by HCN

7. Pre-injection Waste Treatment: Bio-pond with 14 day retention

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	54.5# J-55	13-3/8	1620
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 950 sks Halliburton light cement with gilsonite followed by 200 sks of class H common cement; 125 sks class A common cement with 2% $CaCl_2$.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Float shoe, six centralizers.

5. Bottom Hole Completion: Gravel packed screen

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	____	Average	____	Maximum	____
"	____		____		____
"	____		____		____
"	____		____		____

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	____	Average	____	Maximum	____
"	____		____		____
"	____		____		____
"	____		____		____

3. Annual Volume Injected, gal.
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-102

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: UN

Operating Company Name and Address: Diamond Shamrock Corp.
P.O. Box 631 - Amarillo, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 13 (Month) 08 (Year) 74
2. Latitude and Longitude: 35°59'16"/101°45'15"
3. Well Location (Legal Description): H&TC Survey, Block 44, Sec 199, 2000' FSL and 770' FEL.
4. County: Moore State: Texas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from refinery, gasoline plant, and ammonia plant.
2. Date Well Permitted: 11/23/71 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 5763 ft. (plugged back to 5130 ft.)
6. Name, Age, and Depth of Injection Zone: Granite Wash, Permian 4790 - 5060 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Three Glorietta disposal wells.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0		silt, sand
Ogallala	Pliocene			clay, silt, sand, gravel
Dockum	Triassic	450		shale
Red shale zone	Permian			shale, clay, sandstone
Blaine	Permian			gypsum, anhydrite
Glorietta	Permian	1100	120	sandstone
Cimarron	Permian			anhydrite
Red Cave	Permian			
Panhandle	Permian			limestone, dolomite
Brown	Permian			dolomite
Moore County	Permian			limestone, dolomite
Granite Wash	Permian	4786	300	sandstone

(a)

WIC TX-102

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Granite Wash	
(2) Depth (Ft.)	4786	450
(3) Thickness (Ft.)	300	4300
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Permian	Triassic-Permian
(8) Porosity %	25	
(9) Permeability, millidarcies	150	
(10) Reservoir Temperature, °C	52°	
(11) Character and Areal Distribution	arkosic sandstone widespread	evaporites, sandstone carbonates widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	0	450	extensive	sand,gravel	fresh

4. Mineral Resources in Area: Oil and gas production

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Injection well TX-20

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity). Ammonia, organic acids, phenol, nitrate, chromate, and other inorganics.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 10,000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 7.5 - 8.8

WIC TX-102

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possibly corrosive due to acid

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		94#	20	598
Intermediate		36# J-55 and 40# N-80	9-5/8	5766
		54.5# H-40	13-3/8	1997
Injection		20# K-55 tubing	7	4775
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 20" casing - 1200 sks Halliburton Lite w/2% $CaCl_2$ + 1/4# Floclae/sack; 13-3/8" casing - 540 sks Halliburton Lite w/4% salt + 400 sks class H + 205 sks HLC; 9-5/8" casing - 625 sks HLC w/18% salt + 1/4# Elecele/sack

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker 9-5/8" 5.5 packer at 4755 ft.; Baroid Kote inhibitor

5. Bottom Hole Completion: Iron plug at 5130 ft., perforations 5080 - 4790 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-102

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: TX-103

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND **Operational Status:** PND
Operating Company Name and Address: POCO-AM, Inc.
1108 Fidelity Union Life Bldg., Dallas, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 13 (Month) 08 (Year) 72
2. Latitude and Longitude: 32°36'28"/95°55'26"
3. Well Location (Legal Description): Tract #2, C. Beckett Survey, A-93, from NW corner proceed south along the west line 300 ft.
4. County: Van Zandt State: Texas
5. SIC Classification: 3679

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from an electronic components manufacturing plant.
2. Date Well Permitted: 6/29/72 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Woodbine Sands, Cretaceous 4700-5100 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox Group	Eocene	0	360	sand, clay, shale
Midway	Paleocene			clay, shale
Navarro-Taylor	Cretaceous			clay, shale
Austin	Cretaceous			chalk, marl
Eagle Ford	Cretaceous			clay, shale
Woodbine	Cretaceous			sand

WIC TX-103

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Woodbine	
(2) Depth (Ft.)	4700	
(3) Thickness (Ft.)	400	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cretaceous	
(8) Porosity %	15 - 20	
(9) Permeability, millidarcies	3000	
(10) Reservoir Temperature, °C	55°	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	0	360		sand, clay	fresh

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: TX-10 is 8 miles northeast and is only well located nearby that reaches this depth.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Electronics component plant wastes.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 22.6
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.1
   - D. Temperature: N/A
   - E. pH: 2.2

3. Toxicity: Methyl alcohol toxic to humans; trichloroethylene possibly harmful to biota.

4. Reactivity with Surface Equipment Components: Possible corrosive action of sulfuric acid upon metal fixtures.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably sterile at injection because of low pH, bacterial degradation of some organic fractions may occur

7. Pre-injection Waste Treatment: pH adjustment, filtration, sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 2 - 300 barrel carbon steel storage tands; 1 - 300 barrel carbon steel clear tank.

2. Filters: N/A

WIC TX-103

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: TX-104

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN
Operating Company Name and Address: E.I. DuPont de Nemours and Co.
P.O. Box 1089 - Orange, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 13 (Month) 08 (Year) 72
2. Latitude and Longitude: 30°03'26"/93°44'31"
3. Well Location (Legal Description): 339' FEL and 119' FSL of the H.W. Stark Survey, Ab. - 505
4. County: Orange State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from adipic acid plant.
2. Date Well Permitted: 1/26/72 Completed:
3. Injection Rate: 180 - 350 gpm
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Miocene sands, 4200 - 5200 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Beaumont	Pleistocene	0		clay, sand
Lissie	Pleistocene			clay, sand
Willis	Pliocene	1000		sand
Oakville	Miocene			sandstone
Catahoula	Miocene	4400		sandstone

WIC TX-104

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Catahoula	
(2) Depth (Ft.)	4400	1000
(3) Thickness (Ft.)		3400
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Miocene	Tertiary
(8) Porosity %	33.1	
(9) Permeability, millidarcies	2100	
(10) Reservoir Temperature, °C	55°	
(11) Character and Areal Distribution	sand widespread	clay, sand widespread

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Beaumont	0		extensive	clay, sand	1000 ppm TDS
Lissie		1000	extensive	sand, gravel	3000 ppm TDS

4. Mineral Resources in Area: Production of oil in the area is found at 7600 ft. to 8100 ft. in the Phoenix Lake Field, three miles east of the well. Orange Field is three miles west of the well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: TX-12, TX-23, TX-54, TX-55, TX-56, and TX-57 within 2-1/2 mile radius.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): A dilute aqueous solution of ammonium sulfate, sulfuric acid, and trace quantities of hydrogen cyanide and organic nitriles, and organic acids.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 0.8 - 1.2

WIC TX-104

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion through contact with acidic residues.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-104

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically monitored and reported immediately if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuously

2. Contingency Plan for Well Failure During Operation: Pump to other wells in the area.

3. Regulatory Aspects

A. Construction Requirements: All casing tested for leadage at 1000 psi; injection tubing unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Operating surface pressure - 1750 psig; injection rate - 430 gpm; monthly rate - 18 million gallons.

Well Id. Code: TX-105

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN
Operating Company Name and Address: E.I. DuPont de Nemours and Co.
Victoria, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 28°39'30"/96°56'15"
3. Well Location (Legal Description): Desiderio Garcia League, Ab. - 38
4. County: Victoria State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from the manufacture of nylon.
2. Date Well Permitted: 1/26/72 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC TX-105

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Aqueous wastes from the manufacture of nylon intermediates; small quantities of HNO_3, organic acids, and salts.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion due to acids.

5. Degradability Level and Rate: Possible degradation of organics.

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-105

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if a 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuously

2. Contingency Plan for Well Failure During Operation: Pump wastes to other company wells in the area.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum surface injection pressure: 1250 psia; maximum injection volume: 400 gpm.

Well Id. Code: TX-106

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: E.I. DuPont de Nemours and Co.
P.O. Box 2626 - Victoria, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 28°39'30"/96°56'15"
3. Well Location (Legal Description): Desiderio Garcia League, Ab. - 38
4. County: Victoria State: Texas
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from the manufacture of nylon.
2. Date Well Permitted: 1/26/72 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 4150 ft.
6. Name, Age, and Depth of Injection Zone: Miocene-Oligocene, 3200 - 4600 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC TX-106

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Aqueous wastes from the manufacture of nylon intermediates; small quantities of HNO_3, organic acids, and salts.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possibly corrosive due to acids.

5. Degradability Level and Rate: Possible degradation of organics.

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-106

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuously

2. Contingency Plan for Well Failure During Operation: Pump to other company wells in the immediate vacinity.

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; monitor well head and annulus pressure, rate and volume; report biannually.

C. Restrictions of Operation Procedures: Maximum surface injection pressure: 1250 psia at 400 gpm.

Well Id. Code: TX-107

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN
Operating Company Name and Address: Witco Chemical Co., Marshall Plant
Marshall, Texas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 10 (Year) 72
2. Latitude and Longitude: 32°32'09"/94°15'14"
3. Well Location (Legal Description): N/A
4. County: Harrison State: Texas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from production of hydrogen peroxide and other peroxide products.
2. Date Well Permitted: 5/11/72 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Blossom, Cretaceous 2450 - 2500 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Carrizo	Eocene	0		sand
Wilcox	Eocene		450	clay
Midway	Paleocene	450	1000	clay
Navarro	Cretaceous	1450	400	clay, marl
Blossom	Cretaceous	1850	650	sand

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Blossom	Navarro
(2) Depth (Ft.)	1850	1450
(3) Thickness (Ft.)	650	400
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	0.62-0.73 psi/ft	
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	51°	
(11) Character and Areal Distribution	sand	clay, marl

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Carrizo-Wilcox	0	450	extensive	sand, clay	fresh

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Organic peroxides, peroxide, sulfuric acid, hydrochloric acid, ketones, esters, and salts.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 180,000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 4.0 - 8.0

WIC TX-107

3. Toxicity: High acid concentrations are toxic through pH shifts.

4. Reactivity with Surface Equipment Components: Probably corrosion due to action of acids upon metal fixtures.

5. Degradability Level and Rate: Organic compounds degradable due to oxygen pressence in compounds.

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably sterile at injection due to presence of hydrogen peroxide.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC TX-107

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) N/A Average _____ Maximum _____
" _____ _____ _____
" _____ _____ _____
" _____ _____ _____

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) N/A Average _____ Maximum _____
" _____ _____ _____
" _____ _____ _____
" _____ _____ _____

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ _____ C. 19__ _____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Well head and annulus pressure; injection flow rate and volume.

B. Sampling Frequency and Water Quality Parameters Measured: Periodically measured and reported if 5% variance occurs.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuously

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: All casing must be tested for leakage at 1000 psi; injection tubing must be unaffected by wastes.

B. Monitoring Requirements: Casing and bottom hole pressure tests; complete chemical analysis of wastes; well head and annulus pressure, rates and total volume; report biannually.

C. Restrictions of Operation Procedures: Maximum: surface injection pressure - 1000 psia, rate of injection - 30 gpm, monthly volume - 480,000 gallons.

Well Id. Code: WV-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: E.I. DuPont de Nemours and Company
Belle, West Virginia

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 73
2. Latitude and Longitude: 38°14'41"/81°33'44"
3. Well Location (Legal Description): N/A
4. County: Kanawha State: West Virginia
5. SIC Classification: 2810

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous waste from manufacturing operations.
2. Date Well Permitted: 1/7/66 Completed: 1968
3. Injection Rate: 12,829 gpd
4. Injection Pressure: 645 psi
5. Total Depth of Well: 1500 ft.
6. Name, Age, and Depth of Injection Zone: Salt Sand, Pennsylvanian 1300 ft.
7. Date Injection Began: (Day) (Month) (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC WV-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Salt sand	
(2) Depth (Ft.)	1300	
(3) Thickness (Ft.)	200	
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Pennsylvanian	Pennsylvanian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	shale, sandstone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Aqueous wastes containing sodium and/or calcium chloride = 15-25%, and soluble organic compounds

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Possible corrosion of metallic components by chloride brine.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32.3# H-40	9-5/8	400
Intermediate				
Injection		14# J-55	5-1/2	1500
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Portland cement plug gel and accelerator.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers, guide shoes, collars

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC WV-1

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	10/70	Average	6	Maximum	9
"	12/71		7		22
"	4/72		13		14
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	10/70	Average	620	Maximum	620
"	12/71		480		530
"	4/72		645		690
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow volume, pressure

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Constructed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: WV-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: E.I. Dupont de Nemours and Company
Parkersburg, West Virginia

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 39°16'13"/81°40'03"
3. Well Location (Legal Description): N/A
4. County: Wood State: West Virginia
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous waste from teflon manufacture.
2. Date Well Permitted: Completed: 9/60/66
3. Injection Rate: 106,353 gpd
4. Injection Pressure: 684 psi
5. Total Depth of Well: 1490 ft. (plugged back from 1682 ft.)
6. Name, Age, and Depth of Injection Zone: Pottsville, Pennsylvanian 1134 ft.
7. Date Injection Began: (Day) (Month) 03 (Year) 69
8. Total Volume Injected to Date: 103,470,710 (6/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC WV-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Pottsville	
(2) Depth (Ft.)	1334	
(3) Thickness (Ft.)	112	
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Pennsylvanian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone widespread	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Hydrochloric acid, formic acid formaldehyde, flurocarbon chemicals.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 0.4 - 2.7

WIC WV-3

3. Toxicity: Formaldehyde, formic acid and hydrochloric acid may be toxic.

4. Reactivity with Surface Equipment Components: Possible corrosion with metallic components by acid.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		32.75# H-40	9-5/8	800
Intermediate		20# H-40	6-5/8	1260
		7.4#	6-5/8	320
Injection			3-1/2	1400
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers, guide shoes, float collars

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC WV-3

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	10/70	Average	77	Maximum	90
"	3/71		72		82
"	5/72		72		104
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	10/70	Average	580	Maximum	660
"	3/71		730		820
"	5/72		744		995
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow, volume and pressure meters.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Constructed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: WV-48

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN

Operating Company Name and Address: Weirton Steel, Div. of National Steel Corp.
Weirton, West Virginia

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 40°25'53"/80°36'12"
3. Well Location (Legal Description): N/A
4. County: Hancock State: West Virginia
5. SIC Classification: 3311

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Hydrochloric and sulfuric acids.
2. Date Well Permitted: Completed: 2/15/68
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 1520 ft.
6. Name, Age, and Depth of Injection Zone: Berea, Mississippian 1086 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) plugged (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC WV-48

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Berea	
(2) Depth (Ft.)	1086	
(3) Thickness (Ft.)	30	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Mississippian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone widespread	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste from hydrochloric and sulfuric acid steel mill pickling operations.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 434,000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC WV-48

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Probably corrosive due to acid.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably sterile due to presence of acids.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			16	68
Intermediate			13-3/8	127
			10-3/4	1092
Injection			7	1414
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC WV-48

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) Average Maximum
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) Average Maximum
"
"
"

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: WV-72

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: E.I. DuPont de Nemours and Company
Parkersburg, West Virginia

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 39°16'07"/81°40'34"
3. Well Location (Legal Description): N/A
4. County: Wood State: West Virginia
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant wastes.
2. Date Well Permitted: Completed: 10/22/70
3. Injection Rate: 140,000 gpd
4. Injection Pressure: 520 psi
5. Total Depth of Well: 4105 ft.
6. Name, Age, and Depth of Injection Zone: Onondaga, Devonian
4016 ft.
7. Date Injection Began: (Day) 03 (Month) 10 (Year) 72
8. Total Volume Injected to Date: 2,440,800 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC WV-72

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Onondaga	
(2) Depth (Ft.)	4016	
(3) Thickness (Ft.)	89	
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Pennsylvanian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	shale, sandstone, carbonate

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 6 - 15% hydrochloric acid combined with 2 - 5% solution of formic acid and formaldehyde. Waste will contain less than 10,000 ppm fluro-carbon chemicals and organic compounds.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l: 55,000
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC WV-72

3. Toxicity: Formaldehyde, formic acid and hydrochloric acid may be toxic.

4. Reactivity with Surface Equipment Components: Possible corrosion of metallic components by acids.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		85# H-40	18	50
Intermediate		48# H-40	13-3/8	975
		40# J-55	9-5/8	4350
Injection		18# Type 304 stainless	5-1/2	5900
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): Gray Manifold Series 600, 5-1/2x9-5/8 inch with christmas tree.

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers, guide shoes, and float collars.

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC WV-72

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
4/72	100	120
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
4/72	520	560
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow, volume and pressure monitors

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Constructed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: WV-80

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: PPG Industries, Inc.
Proctor, West Virginia

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 39°45'/80°50'
3. Well Location (Legal Description): N/A
4. County: Marshall State: West Virginia
5. SIC Classification: 2819

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sludge from brine softening process.
2. Date Well Permitted: Completed: 4/13/43
3. Injection Rate: 632 gpd
4. Injection Pressure: 378 psi
5. Total Depth of Well: 6820 ft.
6. Name, Age, and Depth of Injection Zone: Salina Salt, Silurian
6720 ft.
7. Date Injection Began: (Day) 25 (Month) 08 (Year) 66
8. Total Volume Injected to Date: 54,143 (5/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC WV-80

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Salina Salt	
(2) Depth (Ft.)	6720	600
(3) Thickness (Ft.)	100	6100
(4) Formation Fluid Pressure, psi	0.45 psi/ft est	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Silurian	Penn. - Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	salt	shale, sandstone carbonates.

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Slurry containing 5% solids in a brine solution. The solids will consist of 95.6% $CaCO_3$ and 4.4% magnesium hydroxide.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.20 at 25° C
   D. Temperature: N/A
   E. pH: N/A

WIC WV-80

3. Toxicity: Chlorides may be harmful to health; sodium hydroxide may be fatal.

4. Reactivity with Surface Equipment Components: Possible corrosion of metallic components be caustic substances.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		47# J-55	11-3/8	846
Intermediate		39# J-55	8-5/8	6467
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 11-3/8 inch casing - 300 sks cement; 8-5/8 inch casing - 500 sks cement

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC WV-80

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
4/72	0.5	0.75
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
4/72	378	
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow rate, volume and pressure monitors.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Constructed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: WV-85

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Allied Chemical Corporation
Moundsville, West Virginia

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 38°45'47"/80°04'81"
3. Well Location (Legal Description): N/A
4. County: Marshall State: West Virginia
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste brine solution derived from processing natural brine for chemical manufacture.
2. Date Well Permitted: Completed: 6/52
3. Injection Rate: 76,600 gpd
4. Injection Pressure: 388 psi
5. Total Depth of Well: 6523 ft.
6. Name, Age, and Depth of Injection Zone: Salina Salt, Silurian 6400 ft.
7. Date Injection Began: (Day) (Month) (Year) 70
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC WV-85

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Salina Salt	
(2) Depth (Ft.)	6400	
(3) Thickness (Ft.)	156	
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Silurian	Penn - Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	salt	shale, sandstone, carbonates.

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste brine derived from processing natural brines.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: Chlorides limited in domestic water supply to 250 ppm.

4. Reactivity with Surface Equipment Components: Possible corrosion of metallic components.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC WV-85

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	11/70	Average	52	Maximum	80
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	3/70	Average	660	Maximum	698
"	11/70		117		789
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow rate, volume, and pressure monitors

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: WY-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Wycon Chemical Company
Cheyenne, Wyoming

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 27 (Month) 11 (Year) 72
2. Latitude and Longitude: 41°05'21"/104°53'54"
3. Well Location (Legal Description): Sec 16, T13N, R67W
4. County: Laramie State: Wyoming
5. SIC Classification: 2871

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant waste, sometimes heavy in nitrates.
2. Date Well Permitted: 5/28/69 Completed:
3. Injection Rate: 244,544 gpd
4. Injection Pressure: 852 psi
5. Total Depth of Well: 6305 ft.
6. Name, Age, and Depth of Injection Zone: Hygiene, Cretaceous 5831 ft.
7. Date Injection Began: (Day) 30 (Month) 05 (Year) 69
8. Total Volume Injected to Date: 303,600,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Segregated waste water; high chemical concentration evaporated in ponds, and the balance released to stream.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Ogallala	Tertiary	0	161	sandstone, gravel
White River Group	Tertiary	161	550	sandstone, shale
Lance	Cretaceous	711	2501	sandstone, shale, coal
Fox Hill	Cretaceous	3312	272	sandstone
Pierre	Cretaceous	3584	2638	shale, sandstone
(Hygiene Member)		5807	6222	sandstone

(a)

WIC WY-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Hygiene	
(2) Depth (Ft.)	5807	3584
(3) Thickness (Ft.)	415	416
(4) Formation Fluid Pressure, psi	2317	
(5) Lithostatic Pressure, psi	2319	
(6) Hydrofracturing Pressure, psi	1400	
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	5 - 25	
(9) Permeability, millidarcies	475	
(10) Reservoir Temperature, °C	51°	
(11) Character and Areal Distribution	sandstone	shale, siltstone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	0	161	extensive	sandstone	good

4. Mineral Resources in Area: Borie oil field produces from a sand 4100 feet below the Hygiene.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Water with high nitrate concentration sometime in excess of 1000 ppm.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 50
   - B. Conc. Dissolved Solids, mg/l: 5770
   - C. Specific Gravity: 1.0
   - D. Temperature: 40° - 60°F
   - E. pH: 9.4

3. Toxicity: Infant methemoglobinema and cyanosis may result from ingestion of water containing high nitrate.

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Bacterial activity minimal.

7. Pre-injection Waste Treatment: Filtration and addition of antiscale chemical.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade		Size	Depth Set
Surface	12-1/4	32.3#	H-40	9-5/8	1100
Intermediate	9-1/4	23#	J-55	7	5831
Injection		10.5#	J-55	4-1/2	5770
Other					

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 9-5/8 inch casing - 700 sks Class G; 7 inch casing - 1360 sks 50-50 Pozmix w/4% gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Larkin guide shoe on bottom of 9-5/8" string; Baker multiplex shoe on 7" string; Halliburton D.V. tool at 3711 ft.; 16 centralizers on 7" casing.

5. Bottom Hole Completion: Open hole 5831 to 6305 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidization - 2000 gal. HF ; fractured with 400 barrels of water at 2700 psi.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Surge pond lined with 20 mil Hypalon.

2. Filters: Pressure filters with anthracite filter bed.

WIC WY-1

3. **Pumps:** Centrifugal filter feed pump; positive displacement Triplex injection pump - 150 HP - Wilson Snyder rated at 170 gpm

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12/69	Average	178	Maximum	224
"	12/70		150		210
"	12/71		188		236
"	12/72		162		221

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12/69	Average	917	Maximum	1012
"	12/70		820		872
"	12/71		860		906
"	12/72		852		919

3. Annual Volume Injected, gal.
A. 1972 90,000,000 B. 1971 98,965,300 C. 1970 79,075,500

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: Continuous pressure and flow recorders. Operation monitored at minimum 4 hour intervals by operating personnel. Operating data recorded and retained.

   B. Sampling Frequency and Water Quality Parameters Measured: Sampled weekly and analysis made of chemical impurities, hardness, pH, and dissolved solids.

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: Annually

2. Contingency Plan for Well Failure During Operation: 3 lined retaining ponds.

3. Regulatory Aspects

   A. Construction Requirements: Designed by International Pollution Control, Inc. Plans and specifications approved by Wyoming Oil and Gas Commission.

   B. Monitoring Requirements: Annulus pressure checked daily; injection record showing flow, pressure, contaminants submitted monthly to State Engineer.

   C. Restrictions of Operation Procedures: N/A